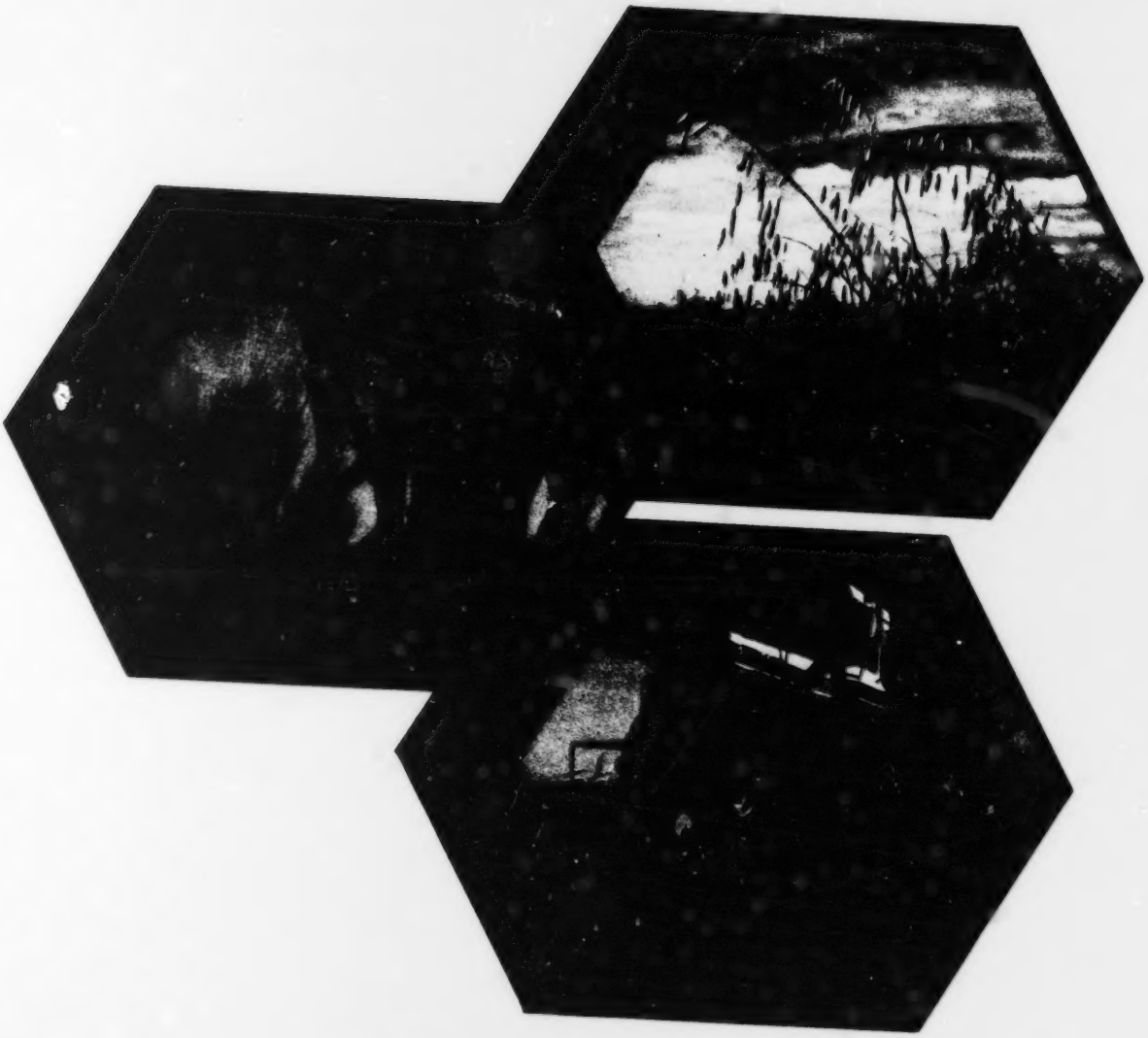
1984

Agdex 641

Guide to Chemical Weed Control



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RELATED PUBLICATIONS

Field Sprayers

Weed Control for Home Grounds

Identifying Weeds on Home Grounds

Weed Seedling Identification

Calibration and Metric Conversions for Farm Sprayers

Calibration for Band Spraying

Metric Units for Herbicide Use

Soil Incorporated Herbicides

Integrated Weed Control Recommendations

Zero Tillage Weed Control

Tank Mixing Wild Oat Herbicides

Plant Growth Stages for Weed Control

How to Control Kochia

Hemp-nettle

Cleavers

Green Foxtail: Manitoba's Most Abundant Weed

Bladder Campion — A Persistent Perennial

Controlling Canada Thistle

The above publications and fact sheets are available from local agricultural representative or weed supervisor offices, or from The Distribution Centre, 411 York Avenue, Winnipeg, R3C 0V8.

1984 Guide to Chemical Weed Control

Prepared by

Manitoba Agriculture in co-operation
with Weed Research Personnel in Industry,
University and Agriculture Canada.

The *Guide To Chemical Weed Control* includes the most recent herbicide recommendations for weed control in Manitoba. These recommendations must be combined with proper recognition of the weed problem, good cultural practices, and crop selection to allow the use of the recommended herbicide.

The rates and methods of application of herbicides are based on research and field experience. Further details on products recommended in this bulletin are outlined on the container labels.

READ AND FOLLOW LABEL INSTRUCTIONS

If you have any doubt regarding the instructions in this bulletin, or on the product label, do not take a chance. Contact the company representative or Manitoba Agriculture for further advice.

This bulletin lists the recommended products for a weed problem giving the trade name of the product. Table 14 lists the technical names of the products corresponding to the trade names.

In the use of herbicides, responsibility rests on the user to prevent spray drift onto susceptible crops, residual contamination of soil to subsequent crops, or damage to crops from improper use.

Additional information on chemical or cultural weed control may be obtained from your agricultural representative, weed specialist, or crop specialist of Manitoba Agriculture; the Plant Science Department, The University of Manitoba; Agriculture Canada Research Centres at Brandon or Morden; the local weed supervisor or technical and sales representatives of the chemical industry.

FOR GOOD WEED CONTROL

- identify the weed problem.
- use the recommended herbicide.
- apply according to directions.

Any use of herbicides not in this publication must have the approval of the Environmental Control Branch of the Department of Environment and Workplace Safety and Health.

Before applying any herbicides, Government Departments, Crown Corporations, Municipal Corporations or any agent acting on their behalf, should contact the Environmental Control Branch of the Department of Environment and Workplace Safety and Health.

REFER TO THE 1984 ADDENDUM TO THE GUIDE TO CHEMICAL WEED CONTROL FOR PRODUCTS WITH NEW OR TEMPORARY REGISTRATIONS (AVAILABLE APRIL 1984)

See field crops chart and forage crops chart at back of guide

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Introduction

Rules for effective weed control

- identify your weed problem
- select the proper herbicide for the crop and the weeds
- use amine formulations of MCPA or 2,4-D for greater crop safety and to reduce the volatility hazard
- adjust and calibrate your sprayer
- apply herbicides at the proper stage for maximum weed control and crop safety
- take time to do a proper job of application
- leave check strip to compare control results
- check fields frequently throughout the season to assess results
- look for ways to improve next year's weed control program

Practice safety in using herbicides

Skill, experience, and knowledge make a safe worker in the field. Know and observe the following guidelines:

1. Never smoke while applying herbicides.
2. Avoid inhaling sprays or dusts. Wear protective clothing and respirator. Additional detail on personal protective equipment is provided below.
3. Sprayer lines carrying herbicide must not enter the operator's cab.
4. Have soap, water and towel available. Should concentrated product spill on skin, hands, face or eyes, wash immediately.
5. Wash hands and face when leaving the treated area, before break periods, lunch, or for comfort.
6. Bath or shower and change to clean clothing after working with herbicides. Wash clothing each day before re-use.
7. Call a physician or get the patient to a hospital immediately if symptoms of illness occur during or shortly after herbicide application. Be sure to take along the product label or container.
8. Store herbicides out of the reach of children.
9. Store herbicides where there is no chance of contact with human food or livestock feeds. Do not store herbicides with insecticides, and avoid cross-contamination.
10. Keep chemicals in their original containers never in unmarked containers or bottles used for food or drink.
11. Never fill spray tanks directly from a potable water source such as a well or dugout.
12. Follow proper container disposal methods. All containers should be triple rinsed or pressure rinsed, punctured to render the container nonreusable, and delivered to designated disposal sites.

Personal Protective Equipment for Herbicide Users

The use of personal protective equipment is an integral but often neglected facet of safety in the handling and application of pesticides, including herbicides. The wearing of a respirator, proper eye shields (goggles), gloves, foot wear, and other protective clothing is therefore recommended.

a) Chemical Cartridge Respirator

Dust masks are ineffective in protecting against herbicide vapours. Similarly, the filters on tractor cabs are intended to remove dust and are not designed to protect against herbicide vapours or mists. Chemical cartridge respirators are recommended for outdoor use when mixing and applying herbicides.

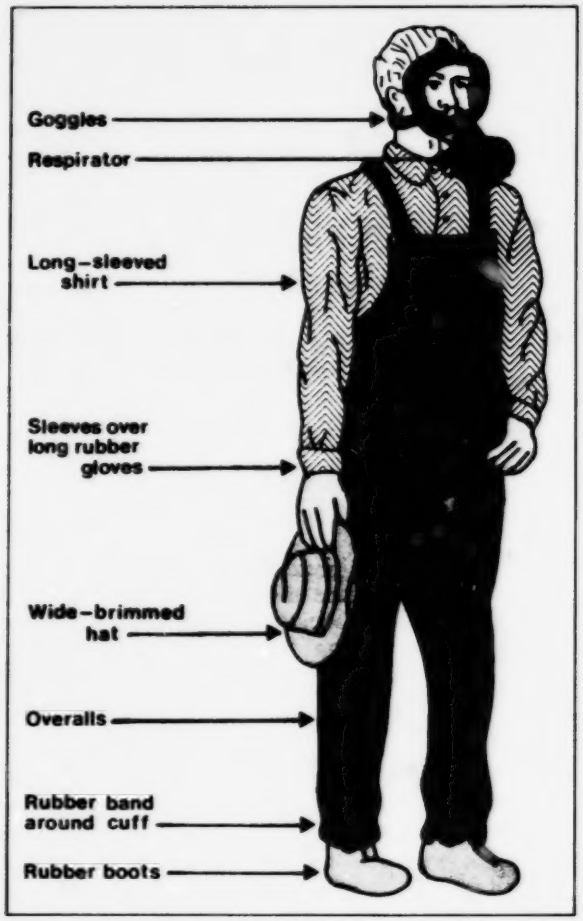
Only NIOSH approved respirators should be used. Do not interchange component parts of respirators. For example, do not use a cartridge produced by company "A" with a respirator produced by company "B" as the combination may not provide adequate protection to the user.

When carrying out spray operations, filters should be changed each day, and the cartridges should be replaced when chemical odour becomes apparent or when breathing becomes difficult. New cartridges should always be installed at the start of the spraying season. Prior to commencing work, the face seal should be checked while the respirator is on the wearer's face. It should be noted that regardless of design, respirators cannot be worn securely by people wearing beards, moustaches or sideburns.

Contact any of the supply companies listed below or the Department of Environment and Workplace Health and Safety for information on respiratory protection against specific herbicides.

b) Eye Protection

The use of protective goggles is necessary and recommended when a full face mask is not worn.



Many goggles are chemical resistant, some have specially treated lenses to reduce fogging, others have anti-fogging ventilation. Prescription type safety spectacles are also available to which side shields can be attached, when necessary.

c) Gloves

Non-absorbent gloves should be worn at all times while handling, mixing and applying herbicides. Neoprene has been found superior to rubber in resisting the absorptive penetration of many substances associated with herbicides.

Other factors to be considered in selecting suitable gloves include sense of touch, wet grip, cut resistance, and abrasion resistance. Gloves should fit snugly. Fabric wrist gloves should not be considered.

d) Footwear

Non-absorbent footwear should be worn when applying herbicides.

For emergency situations, such as herbicide spills, suitable protective footwear should be available. It is suggested that the most suitable boot is one that is knee length, acid and solvent resistant, and cleated or ribbed to prevent slippage. Neoprene is considered much superior to rubber in withstanding various acids and solvents.

e) Other Clothing

A major concern in agricultural herbicide spraying is the unwillingness of the applicator to wear some form of protective clothing, particularly under warm summer conditions. At the very least, coveralls should be worn along with gloves and a hat to minimize the hazard of dermally toxic herbicides. The clothing should be changed and washed regularly following spraying.

Disposable garments suitable for herbicide work are now available. Made of "Tyvek" polyethylene fibres, such clothing will provide protection against dermal exposure resulting from pesticide drift, splashing, or spills. Light-weight and economical, disposal garments are available as coveralls, shirts and pants, headcovers, and aprons.

Supplies of goggles, prescription type safety spectacles, neoprene gloves, and boots and other protective clothing including hats are available from any one the major safety supply companies listed below.

Availability

Many safety supply companies carry out business in Manitoba providing a wide range of products. Some firms offer complete lines, others specialize. The following companies are in a position to meet the needs of herbicide users:

— IPACO Safety Products

— Levitt - Safety Limited

— Mackay Morton Limited

— MSA Canada Incorporated

— McVicar Safety Supplies Limited

— Safety Centre Limited

— Safety Supply Canada

Check the Telephone Directory Yellow Pages for addresses and branch locations.

IN CASE OF ACCIDENT OR POISONING WITH ANY PESTICIDE, CONTACT YOUR LOCAL HOSPITAL. FOR FURTHER INFORMATION, CONTACT:

POISON CONTROL

HEALTH SCIENCES CENTRE

CHILDREN'S CENTRE

685 BANNATYNE AVENUE

WINNIPEG, MANITOBA, R3E 0W1

TELEPHONE: 1-787-2591

Weed Control Glossary

Abscission layer — separation layer that develops typically (not always) at the base of the leaf stalk, which eventually permits the leaf to fall. In some species, this layer forms even before the leaf is mature.

Acid equivalent — theoretical yield of parent acid from an active ingredient. For example, the active ingredient in a 2,4,-D formulation may be 2,4-D amine or 2,4-D ester. The parent acid is the 2,4-D, and the acid equivalent is the amount of 2,4-D (acid) in the formulation. This amount is usually given as grams per litre.

Active ingredient — chemical compound in a product that is responsible for the herbicidal effects.

Adjuvant — ingredient which when added to a formulation or spray mixture alters the action of the active ingredient.

Amine — water-soluble, non-volatile herbicide that forms a true solution in water.

Annual — plant that completes its life cycle from seed in less than one year. Summer annuals begin growth in the spring and mature by fall. Winter annuals begin growth in the fall and mature the following spring or early summer.

Authorized applicator — applicator having a current license under the Pesticides and Fertilizers Control Act, and approved by the Weed Control Section of Manitoba Agriculture for applying the specified product.

Band treatment — herbicide applied as a narrow strip over the crop row, usually combined with inter-row cultivation.

Biennial — plant that lives more than one year but not over two years.

Compatible — compounds or formulations that can be mixed and applied together without undesirably altering their separate effects.

Contact herbicide — herbicide that does not move within the plant and has a direct effect only on that part of the plant which is covered by the spray mixture.

Crop protectant — additive to a herbicide that protects the crop against the effects of the herbicide.

Desiccation — the chemically accelerated drying of plants. The ripening of the crop is more uniform.

Directed spray — spray directed on weeds or soil in such a manner as to avoid contact with the crop.

Dormant — resting stage similar to the condition of a plant during the winter.

Drag-off — procedure of knocking down seeding hills, spraying and re-hilling prior to emergence.

Dry flowable — herbicide formulation composed of small granules of active and inert ingredients for dilution in water to form a suspension. Can be measured volumetrically or by weight.

Emergence — time at which the seedling first appears above the ground.

Emulsion — mixture of two liquids held together by a third chemical or emulsifier (usually oil in water with an emulsifier).

Estemine — specially formulated MCPA or 2,4-D amine.

Ester — oil-soluble volatile herbicide that forms an emulsion when mixed with water.

Flowable (liquid) — herbicide formulation with solid particles suspended in a liquid, similar to a wettable powder in a slurry form.

Formulation — type of herbicide commercially available, such as ester, amine, or sodium salt.

Granular formulation — herbicide formulated by attaching it to a granular material such as clay.

Herbicide — chemical which is used to destroy or inhibit growth of weeds.

Incorporation — thorough mixing of a chemical into the soil to a depth recommended for the specific product.

Low volatile ester (LV) — oil-soluble herbicide similar to an ester but usually less volatile because it has a longer molecular chain.

Non-selective herbicide — herbicide that can be used to control plants generally without regard to species.

Patch treatment — application of a herbicide to infested areas within a field, where no restriction other than cost prevents treatment of the entire field.

Perennial — plant that normally lives for more than two years.

Postemergence — application after the crop and weeds emerge.

Potassium salt — a water soluble, non-volatile herbicide that forms a true solution in water.

Precipitate — a substance, usually crystalline, separated from a solution as a solid. May be formed by the interaction of two pesticides or a pesticide and water. The precipitate settles and may clog screens and filters.

Preemergence — application before the crop and weeds emerge.

Preplant — application before a crop is planted.

Product — contents of a herbicide container as marketed.

Resistant — crop not damaged by a herbicide if applied as recommended, or a weed not controlled by any practical rate of herbicide.

Seedling — refers to the early stages of growth of crop plants or weeds; technically a plant prior to the development of a root system other than the seed or seminal root.

Selective herbicide — chemical used in such a manner that it will control weeds in a growing crop without damaging the crop.

Sodium salt — water-soluble non-volatile herbicide that forms a true solution in water.

Soil sterilant — chemical that prevents the growth of all plants.

Soluble powder — salt formulated as a powder and soluble in water.

Spot treatment — application of a herbicide to an infestation not exceeding 0.4 ha (1 A) in size, and where the total of all spots treated does not exceed 5 per cent of the total field.

Stale seedbed — seedbed prepared for planting, with subsequent weed growth controlled with a herbicide, thereby allowing the crop to be seeded with minimal soil disturbance.

Surfactant — wetting agent.

Susceptible — crop that may be damaged, or a weed that may be controlled readily by a recommended rate of herbicide.

Tank mix — two chemicals that are purchased separately and mixed in the sprayer tank - as opposed to a mixture formulated by the manufacturer.

Tolerance — ability of a plant to withstand the herbicidal effects of a chemical so that the plant's growth and development are not adversely affected.

Translocated herbicide (systemic) — herbicide that moves within the plant.

Water dispersible granule — granular formulation designed to be dispersed in water for application as a spray.

Weed control — process of limiting weed infestations so that crops can be grown profitably or other operations can be conducted efficiently.

Wettable powder — powder that will readily form a suspension in water. Suspensions require agitation to prevent settling of the solid particles.

Using The Guide

The *Guide to Chemical Weed Control* contains information on registered herbicide uses which apply to Manitoba. Consult product labels for detailed instructions.

Rates are given as the amount of product required unless specified as active rates. Be sure product concentrations match the concentration shown.

The Guide contains recommendations in metric units. The metric units correspond to the new product labels. A section *The Metric System* follows and provides information on metric units.

Weeds controlled by each herbicide are shown in summary tables, or are listed in the individual recommendation. Separate tables are included for corn (Table 3) and sugar beet (Table 6) herbicides. Herbicides for other field crops, including cereals are covered in a chart (Table 15) at the back of the Guide. A chart (Table 16) for forage crops is also included. Horticultural crop herbicides are summarized in Table 7.

Recommendations are grouped for each crop. Consider all recommendations available for the crop and select the one most suited to your situation. Additional information for most products is included in the section *Special Application Instructions*. Refer also to the product label.

Most recommendations are for application using a standard type of field sprayer. Recommendations for aerial application are provided in a separate section (Table 8). The section *Special Application Instructions* and product labels contain information on other equipment.

Refer to the Manitoba Agriculture publication *Field Sprayers* for information on sprayer calibration and adjustments. This publication also has information on specific nozzle types, pressures, heights, sprayer components, operation and cleaning. The Manitoba Agriculture factsheet *Calibration and Metric Conversions for Farm Sprayers* is also available.

Summary

1. Use appropriate summary charts to match the crop and weed problems to the herbicides available (most field and forage crops in Tables 15 and 16 at the back of the Guide).
2. Turn to section covering the crop.
3. Consider all possible alternatives and select the most suitable recommendation.
4. Refer, where indicated, to additional sources of information such as the section *Special Application Instructions*.
5. Read and follow label instructions.

Field sprayer recommendations

- Do not use air blast or air mist sprayers to apply herbicides.
- Do not spray in winds above 20 km/h.
- Avoid using nozzle pressures above 300 kPa.
- Use a minimum of 100 L/ha water for all herbicides unless otherwise specified for the product.
- Use a nozzle height of one metre or less above target. Lower nozzle heights reduce the amount of spray drift produced.
- Do not spray when the wind is blowing towards a nearby sensitive crop, shelterbelt or garden.
- Avoid spraying in a dead calm near sensitive plants.
- Do not use end nozzles for field spraying. Use them only for areas inaccessible to the spray boom, and only when winds are very light.
- Select nozzles that will produce uniform patterns, correct application rates and low drift hazards. For most conditions, 80° flat fan nozzles produce a better combination of pattern uniformity and drift control than do flooding nozzles, 65° or 73° flat fan nozzles, or cone nozzles.

The Metric System

The Pest Control Products Act of Canada requires herbicide labels to be in metric units only. Since labels are metric, use the metric units to prevent confusion.

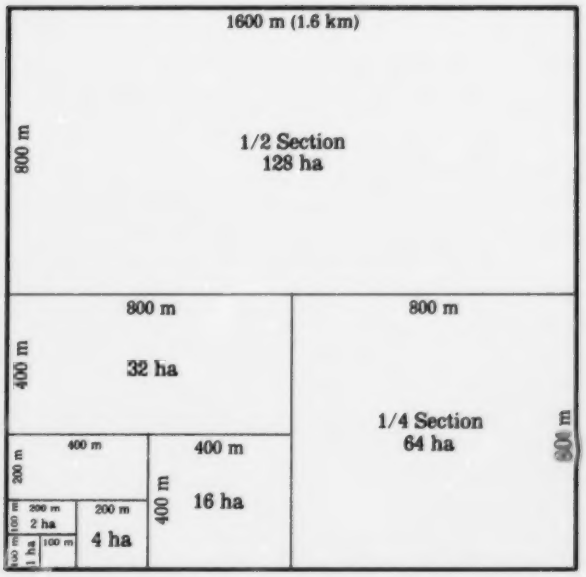
Do not attempt to convert between the metric and Imperial system.

Acres to hectares

Rates and water volumes are based on areas expressed as hectares.

Acres can be converted to hectares by dividing acres by 2.5, or by using the following chart.

To use the chart go down the acre range column to the correct range and then across to the exact acre figure. For example, if field size is 49.0 acres, go down to the 40 - 49 range and across to the 9 column. The answer is 19.6 hectares. This can be rounded to 20 hectares.



Acre Range	0	1	2	3	4	5	6	7	8	9
0 - 9	0	0.4	0.8	1.2	1.6	2.0	2.4	2.8	3.2	3.6
10 - 19	4.0	4.4	4.8	5.2	5.6	6.0	6.4	6.8	7.2	7.6
20 - 29	8.0	8.4	8.8	9.2	9.6	10.0	10.4	10.8	11.2	11.6
30 - 39	12.0	12.4	12.8	13.2	13.6	14.0	14.4	14.8	15.2	15.6
40 - 49	16.0	16.4	16.8	17.2	17.6	18.0	18.4	18.8	19.2	19.6
50 - 59	20.0	20.4	20.8	21.2	21.6	22.0	22.4	22.8	23.2	23.6
60 - 69	24.0	24.4	24.8	25.2	25.6	26.0	26.4	26.8	27.2	27.6
70 - 79	28.0	28.4	28.8	29.2	29.6	30.0	30.4	30.8	31.2	31.6
80 - 89	32.0	32.4	32.8	33.2	33.6	34.0	34.4	34.8	35.2	35.6
90 - 99	36.0	36.4	36.8	37.2	37.6	38.0	38.4	38.8	39.2	39.6

1 acre = 0.4 hectare 1 hectare = 2.5 acres 1 ha = 10 000 m^2

For field sizes over 100 acres, start with 40 hectares for each 100 acres and use the chart for the remaining acres. For example, if field size is 149.0 acres, start with 40 hectares and add 19.6 from the chart to get a final answer of 59.6 or 60 hectares.

Figure 1 indicates field sizes in relation to a section of land. A section contains 256 hectares (640 A) and is 1600 metres (1 mile) by 1600 metres (1 mile). To save time insert the number of hectares in each field on a field map.

Product required

Where rates are given as product per hectare, multiply the rate by field size in hectares to determine product requirements. Divide by container size to determine the number of containers required. The same procedure is used for determining amount of product required for each sprayer tank once you know hectares covered by each tank.

Example 1 (liquid) Field size is 30 hectares (75 A). Rate of application is 2 litres/hectare (0.71 qt/A). Each pail contains 20 litres (4.4 gal).

$$\frac{2 \text{ L/ha} \times 30 \text{ ha}}{20 \text{ L}} = 3 \text{ pails} \qquad \frac{0.71 \text{ qt/A} \times 75 \text{ A}}{4.4 \text{ gal} \times 4 \text{ qt/gal}} = 3 \text{ pails}$$

Example 2 (granular) Field size is 20 hectares (50 A). Rate of application is 10 kg/ha (8.92 lb/A). Each bag contains 25 kilograms (55.1 lb) product.

$$\frac{10 \text{ kg/ha} \times 20 \text{ ha}}{25 \text{ kg}} = 8 \text{ bags} \qquad \frac{8.92 \text{ lb/A} \times 50 \text{ A}}{55.1 \text{ lb}} = 8 \text{ bags}$$

Metric Conversion Factors

Symbols

Length	*Area*	*Weight*	*Volume*
mm - millimetre	m^2 - square metre	mg - milligram	mL - millilitre
cm - centimetre	ha - hectare	g - gram	L - litre
m - metre		kg - kilogram	m^3 - cubic metre
km - kilometre		t - tonne	

Pressure	*Temperature*
kPa - kilopascal	°C - degree Celsius

Relationships

Length	*Area*	*Weight*	*Volume*
10 mm = 1 cm	10 000 m^2 = 1 ha	1000 mg = 1g	1000 mL = 1 L
100 cm = 1 m		1000 g = 1 kg	1000 L = 1 m^3
1000 m = 1 km		1000 kg = 1 t	

Length	*Area*	*Weight*	*Volume*
1 in = 2.54 cm	1 sq in = 6.452 cm^2	1 oz = 28.35 g	1 fl oz = 28.41 mL
1 ft = 0.3048 m	1 sq ft = 0.093 m^2	1 lb = 0.4536 kg	1 fl oz (US) = 29.57 mL
1 yd = 0.914 m	1 sq yd = 0.836 m^2	1 ton = 0.907 t	1 pint = 0.568 L
1 mile = 1.609 km	1 acre = 0.4047 ha	1 kg = 2.20 lbs	1 quart = 1.137 L
1 m = 1.09 yd	1 sq mile = 256 ha		1 gal = 4.546 L
1 m = 3.28 ft	1 ha = 2.47A (round to 2.5 in most cases)		1 US gal = 3.785 L
	1 m^2 = 10.8 ft^2		1 cu in = 16.387 cm^3
	1 m^2 = 1.2 yd^2		1 cu ft = 0.028 m^3
			1 cu yd = 0.765 m^3
			1L = 0.88 qt
			1L = 0.22 gal
			1 m^3 = 35.71 ft^3
			1 m^3 = 1.31 yd^3

Proportion	*Temperature*
1 fl oz/acre = 70.21 mL/ha	°C = 5/9 (°F - 32)
1 oz/acre = 70.06 g/ha	°F = 9/5 °C + 32
1 lb per acre = 1.121 kg/ha	
1 lb/in^2 (psi) = 6.895 kPa	
1 pint/acre = 1.40 L/ha	
1 qt/acre = 2.81 L/ha	
1 gal/acre = 11.23 L/ha	
1 kg/ha = 0.89 lb/A	
1 L/ha = .089 gal/acre	

NOTE: ***The Manitoba Agriculture factsheet Metric Units for Herbicide Use contains additional information.***

Approximate Conversions

acres	*hectares*
1	0.4
2.5	1
5	2
10	4
15	6
20	8
25	10
30	12
40	16
50	20
60	24
75	30

gallons	*litres*
100	450
110	500
150	700
200	900
220	1000
250	1100
300	1400
330	1500
350	1600
400	1800
440	2000
500	2300

gallons per acre	*litres per hectare*
4	45
4.5	50
5	55
9	100
10	110
13.5	150
15	170
18	200
20	220
50	550

psi	*kPa*
15	100
20	150
25	175
30	200
35	250
40	275
45	300
50	350

U.S. gallons	*litres*
100	380
200	760
300	1140
400	1510
500	1890
600	2270

ounces per acre	*grams per hectare*
1	70
2	150
4	275
6	425
8	550
10	700
12	850

pounds per acre	*kilograms per hectare*
0.90	1.00
1.00	1.10
1.25	1.50
1.50	1.75
1.75	2.00
2.00	2.25
2.70	3.00
3.00	3.25
4.00	4.50
4.50	5.00
6.00	6.75
9.00	10.00
10.00	11.00
25.00	27.50

Tank mixes

A tank mix involves the purchase of two chemicals separately and mixing them in the sprayer tank, as opposed to a mixture formulated by the manufacturer.

CAUTION: *Use tank mixes only when registered and recommended for use. Other mixtures may not be effective, may injure the crop, or may leave a harmful residue in the treated crop.*

When mixing herbicides to be applied in one operation, first mix one with the quantity of water to be used and agitate before the second is added. To reduce the possibility of formation of precipitates or gums which may clog nozzles and filters, add herbicides to the spray tank in the following order:

1. soluble powders
2. wettable powders and flowable liquids
3. solutions (amines and salts)
4. additives (surfactants)
5. emulsifiable concentrates (esters)

For specific mixing instructions always check the product label as there may be exceptions to the mixing order.

Cereals

NOTE: *See the Field Crops Chart at back of the book for a summary of recommended herbicides and weeds controlled by each product.*

Barley

TABLE 1. SUMMARY OF BARLEY RECOMMENDATIONS

See Table 15 for complete weed spectrum.

HERBICIDE	Barnyard grass	Foxtail, yellow & green	Wild oats	Buckwheat, wild	Catchfly, night flowering	Chickweed	Cleavers	Cow cockle	Cocklebur	Flixweed	Hemp nettle	Kochia	Lamb's quarters	Mustard, wild	Pigweed, red root	Russian thistle	Shepherd's purse	Smartweed, annual species	Stinkweed	Thistle, sow (perennial)	Thistle, Canada
Avadex BW			●																		
Avadex BW + Treflan EC		●	●																		
Treflan EC		●																			
Afolan or Lorox + MCPA		S		●		●		●	●	●	●	●	●	●	●		●	●	●	□	□
Avenge 200 C			●																		
Avenge 200 C + Brominal M or Bromox 450 M or Buctril M or Sabre			●	●				●	●	●		●	●	●	●	●	●	●	●	□[b]	□[b]
Avenge 200 C + MCPA ester or 2,4-D LV Ester			●						●	●			●	●		●[d]	●		●	□	□
Avenge 200 C + Pardner or Torch or Torch DS			●	●				●	●			●	●	●	●	●		●	●		
Banvel + MCPA or 2,4-D				●	O		●	●	●	●	●[a]	●	●	●	●	●	●	●	●	□	□
Blagal				●		●				●	●		●	●	●		●	●	●	□	□
Brominal M, Bromox 450 M, Buctril M or Sabre				●				●	●	●		●	●	●	●	●	●	●	●	□[b]	□[b]
DyVel				●	O		●	●	●	●	●	●	●	●	●	●	●	●	●	□	□
Estaprop				●					●	●		●	●	●	●	●	●	●	●	□	□
Hoe-Grass	●	●	●																		
Hoe-Grass + Pardner or Torch or Torch DS	●	●	●	●				●	●			●	●	●	●	●		●	●		
Hoe-Grass II	●	●	●	●				●	●			●	●	●	●	●		●	●		
Kil-Mor				●	O		O	●	●	●		●	●	●	●	●	●	●	●	□	□
Lexone/Sencor					●	●					●		●	*	●	●		●	*		
Lexone/Sencor + MCPA or 2,4-D					●	●			●	●	●		●	●	●	●	●	●	●		
Lexone/Sencor + Banvel				●	●	●					●		●	●	●	●		●	●	□	□
MCPA									*	*			*	*			*		*	□	□
MCPAK									*	*	●		*	*			*		*	□	□
NaTA TCA/TCA Solution		●																			
NaTA TCA/TCA Solution + MCPA or 2,4-D		●							*	*			*	*		●[d]	*		*	□	□
NaTA TCA/TCA Solution + Buctril M		●		●				●	●	●		●	●	●	●	●	●	●	●	□[b]	□[b]
Pardner/Torch/Torch DS				●				●	●			●	●	●	●	●		●	●		
Pardner/Torch/Torch DS + MCPA or 2,4-D				●				●	●	●		●	●	●		●	●	●	●	□[b]	□[b]
Stampede 360		●		●									●		●		●	●	●[c]		
Stampede 360 + MCPA ester		●		●						●		●	●	●	●		●	●	●		
Stampede CM		●		●						●			●	●	●		●	●	●		
Target				●	O		O	●	O	●	S	O	●	●	●	●	●	●	●	□	□
Tordon 202 C				●					●				●	●	●	●		●	●	□	□
2,4-D									●	*			*	*		●	*		*	□	□

LEGEND

● Controlled by maximum rate recommended for barley. Where two or more brand names are recommended, the weed may not appear on both labels.

* Controlled by rates less than the maximum recommended for barley.

S Suppression

O Not labelled for control but adequate control can be expected.

□ Top growth control only.

[a] Use MCPAK for hemp-nettle control.

[b] Regrowth can be expected.

[c] Rosette stage only.

[d] Use 2,4-D for Russian Thistle control.

Preplant or preemergence incorporated

Avadex BW (400 g/L), Avadex BW Granular (10%) Controls wild oats. Apply 4.25 L/ha or 17.5 kg/ha granular product in the fall or before seeding in the spring. The granular formulation is more suited to fall applications, the liquid to spring applications. The liquid product should be applied in 100 L/ha water. Use a suitable granular applicator to apply the granular product. Refer to the Herbicide Information section for application and incorporation instructions.

Application can also be made after seeding but wild oat control will generally be less than with earlier applications especially if the soil is dry.

The liquid product may be applied with liquid fertilizer as a carrier, or sprayed on dry urea fertilizer. Refer to the *Herbicide Information* section for incorporation instructions.

Avadex BW Granular may be applied by air. See Aerial Recommendations for Field Crops. (Table 8).

Do not seed domestic oats the year after treatment with Avadex BW.

Avadex BW (400 g/L) plus Treflan EC (545 g/L) Controls wild oats, green and yellow foxtail. Apply at 4.25 L/ha Avadex plus 1.1 to 1.5 L/ha Treflan EC in at least 100 L/ha of water, after seeding but prior to crop emergence. Barley must be seeded to a depth of 5 to 7.5 cm. Use the lower rate of Treflan EC on light sandy soils up to 6 per cent organic matter. Incorporate as soon as possible after application (within eight hours) with a tyne or diamond harrow operated twice over the area at a speed of 8 km/h or more. Both incorporations must be done within 24 hours of application. Apply only to a trash free surface. Treflan EC leaves a residue in the soil which may affect the subsequent crop. Check the *Herbicide Information* section for susceptible crops.

Treflan EC (545 g/L) Controls green and yellow foxtail. Apply at 1.1 to 1.5 L/ha after seeding but prior to crop emergence. Barley must be seeded to a depth of 5 to 7.5 cm. Use the lower rate on light sandy soils up to 6 per cent organic matter. Apply in at least 100 L/ha of water. Incorporate as soon as possible after application (within eight hours) with a tyne or diamond harrow operated twice over the area at a speed of 8 km/h or greater. Both incorporations must be done within 24 hours of application. Apply only to a trash free surface. Treflan leaves a residue in the soil which may affect the subsequent crop. See the *Herbicide Information* section for susceptible crops.

Postemergence

Afolan F (450 g/L) or Lorox L (480 g/L) plus MCPA amine Controls several broadleaf weeds and suppresses green foxtail. See *Table 1 and Field Crops Chart* Tank mix 470 to 620 mL/ha Afolan F with 1.1 L/ha MCPA amine (500 g/L) or 425 to 550 mL/ha of Lorox L with 840 to 1120 mL/ha MCPA amine (500 g/L) For product volumes of other MCPA amine formulations refer to Table 10. Apply in 100 L/ha water when the weeds are in the one to four leaf stage (green foxtail in the one to three leaf stage) and the crop is in the two to four leaf stage. Hemp nettle must be treated before the full four leaf stage. Be sure to use 50 mesh screens in the filter and nozzles. Use the lower rates when growing conditions and rainfall are above average. Refer to *Herbicide Information* section for mixing instructions.

Avenge 200 C (200 g/L) Controls wild oats. Apply 3.5 to 4.25 L/ha in 100 L water. Use the higher rate of application if the wild oat population is greater than 200 wild oat plants per square metre. Nozzle tip pressure should be 276 kPa. Direct nozzles to spray at a 45° angle in the direction of travel. Apply to a dry crop (no dew or rain) before barley is past the six leaf stage, when wild oats are in the three to five leaf stage. Avoid grazing for eight weeks after application. Do not apply if rain is forecast within six hours. Avenge may be tank mixed with MCPA ester, 2,4-D LV ester, Brominal M, Bromox 450 M, Buctril M, Sabre, Pardner, Torch or Torch DS. See *Herbicide Information* section for application instructions. Avenge 200C may be applied by air. See *Aerial Recommendations for Field Crops.* (Table 8)

Banvel (400 g/L) Controls several broadleaf weeds. See *Table 1 and Field Crops Chart.* Apply at 275 mL/ha, tank mixed with the amine or potassium or sodium salt formulations of MCPA or amines of 2,4-D at 850 mL/ha of products containing 500 g/L 2,4-D or MCPA. For product volumes of other MCPA or 2,4-D formulations refer to Table 10. Use a minimum spray volume of 110 L/ha water. Spray at the two to three leaf stage for optimum crop safety. The Banvel & MCPAK tank mix can safely be applied when the crop is in the two to five leaf stage. Do not treat after the five leaf stage of barley.

Blagal (375 g/L) Controls several broadleaf weeds. See *Table 1 and Field Crops Chart.* Apply 2.25 L/ha in 100 L water at a minimum pressure of 275 kPa. Blagal should be applied to actively growing weeds in the two to five leaf stage (hemp nettle two to four leaf stage), and when the crop is in the two to five leaf stage. If the crop is under stress (lack of moisture or extremes in temperature) a temporary yellowing of the lower crop leaves may occur. The crop will recover with no adverse effects on yield. Refer to the *Herbicide Information* section for application instructions.

Brominal M (450 g/L) Bromox 450 M (450 g/L) Buctril M (450 g/L), Sabre (720 g/L) Controls several broadleaf weeds. See *Table 1 and Field Crops Chart.* Apply 1.25 L/ha Brominal M, Bromox 450 M or Buctril M or 780 mL/ha Sabre in 100 L water when weeds are in the two to four leaf stage. These treatments will give some top growth control of Canada thistle and perennial sow-thistle but regrowth can be expected. Barley can be sprayed safely until the early shot blade stage but weeds will not be adequately controlled once the crop shields the weeds.

Brominal M and Bromox 450 M can be applied by air. See Table 8.

Bromox 450 M See Brominal M

Buctril M See Brominal M

Carbyne 2 EC (240 g/L) Carbyne is registered for wild oat control in barley. See product label for application details. For best results Carbyne must be applied when wild oats are in the one to two leaf stage. Vigorous crop competition is necessary to suppress the remaining wild oats. To improve control with Carbyne apply only at the higher registered rates of 1.5 to 1.75 L/ha.

DyVel (420 g/L) Controls several broadleaf weeds. See *Table 1 and Field Crops Chart.* Apply at 1.25 L/ha in a minimum of 110 L water. Spray at the two to three leaf stage for optimum crop safety. Do not treat after the five leaf stage for barley. Hemp nettle, corn spurry and cow cockle must be treated before the full four leaf stage.

Estaprop (600 g/L) Controls several broadleaf weeds. See *Table 1 and Field Crops Chart.* Apply 1.75 L/ha in a minimum of 100 L water. Spray when the crop is in the four leaf to shot blade stage. Best control is obtained when the weeds are in the two to four leaf stage.

Hoe-Grass (190 g/L) Controls wild oats, green and yellow foxtail, barnyard grass. Apply at 3.75 L/ha in at least 110 L water with nozzles directed 45° forward. Apply when weeds are in the one to four leaf stage and before tillering.

Hoe-Grass must be applied in the 1 to 4 leaf stage of barley and before tillering (stooling). Application beyond this stage will result in crop damage. Certain environmental conditions should be avoided when applying Hoe-Grass on barley, i.e. prolonged cool, humid periods, drought and frost.

Hoe-Grass may be tank mixed with 1.25 L/ha Pardner or Torch or 625 mL/ha of Torch DS to control weeds susceptible to these products. Wild mustard will not be controlled beyond the three leaf stage. If a wide range of leaf stages are present at the time of spraying a split application involving Hoe-Grass and another broadleaf herbicide may be advisable to obtain adequate control of wild mustard. When applying broadleaf herbicides other than Pardner or Torch, allow at least four days after the application of Hoe-Grass.

Do not apply Hoe-Grass if rain is expected within one hour. See the *Herbicide Information* section for additional instructions. For aerial recommendations see Table 8.

CAUTION: *Do not apply Hoe-Grass on Klages or Betzes barley. Research on Norbert and Glenn barley is incomplete and use of Hoe-Grass on these varieties is not recommended.*

Hoe-Grass II (310 g/L) Controls wild oats, green and yellow foxtail, and several broadleaf weeds. *See Table 1 and Field Crops Chart.* Apply 3.5 L/ha in not less than 110 L water with nozzles directed 45° forward.

Apply when wild oats, foxtail and barnyard grass are in the one to four leaf stage and before tillering, when Russian thistle is up to 5 cm in height and when other broadleaf weeds are up to the early four leaf stage.

Wild mustard will not be controlled beyond the three leaf stage. If a wide range of leaf stages are present at the time of spraying a split application involving Hoe-Grass and another broadleaf herbicide may be advisable to obtain adequate control of wild mustard.

Hoe-Grass II must be applied in the one to four leaf stage of barley and before tillering (stooling). Application beyond this stage will result in crop damage. Certain environmental conditions should be avoided when applying Hoe-Grass II on barley, i.e. prolonged cool, humid periods, drought and frost. Application on Norbert, Glenn, Klages and Betzes barley is not recommended. These varieties are especially sensitive to Hoe-Grass under these environmental conditions.

Do not apply Hoe-Grass II if rain is expected within one hour. See the Herbicide Information section for additional instructions. Application of Hoe-Grass II by aircraft is not recommended.

Kil-mor (500 g/L) Controls several broadleaf weeds. See *Table 1 and Field Crops Chart.* Apply 850 mL/ha in 100 L water. Apply when weeds are actively growing and are in the two to three leaf stage. Spray at the two to three leaf stage for optimum crop safety.

Lexone DF (75%), Lexone L (480 g/L), Sencor 500 (500 g/L) Sencor 75 DF (75%) Controls several broadleaf weeds. *See Table 1 and Field Crops Chart.* Apply 275 to 350 g/ha product Lexone DF, 425 to 550 mL/ha Lexone L, 425 to 550 mL/ha Sencor 500 or 200 to 375 g/ha Sencor 75 DF in 100 L water. Apply when barley is in the two to five leaf stage. Use the higher rate when weed infestation is heavy and to improve residual control of chickweed.

Lexone or Sencor 500 may be tank mixed with 840 to 1120 mL/ha MCPA amine (500 g/L), or Sencor with 840 to 1120 mL/ha 2,4-D amine (500 g/L), to add control of top growth of Canada thistle and other MCPA, 2,4-D susceptible weeds. Apply at the three to four leaf stage of the crop.

Lexone or Sencor 500 at the low rate may be tank mixed with 275 mL/ha Banvel (400 g/L) to add control of Canada thistle and wild buckwheat. Use this tank mix when barley is in the two to three leaf stage.

Sencor 500 at 275 mL/ha may be used for control of stinkweed, volunteer rapeseed and wild mustard only. It can be tank mixed with 840 to 1120 mL/ha MCPA amine or 2,4-D amine containing 500 g/L MCPA or 2,4-D, or 275 mL/ha Banvel (400 g/L). For product volumes of other MCPA amine or 2,4-D amine formulations, see Table 10.

Temporary (seven to ten days) lightening in crop color and a slight reduction in crop height may be observed, especially if frost or abnormally high temperatures occur within one or two days after application. Do not apply Lexone or Sencor for four to five days after a frost. Allow a four to five day interval between applications of Lexone or Sencor and wild oat herbicides. Do not apply Sencor if rain is expected within six hours,

or Lexone if rain is expected within two hours. See the *Herbicide Information* section for additional instructions.

CAUTION: *Barley must be planted at least 5 cm below the soil surface. Do not apply to Klondike barley.*

Lorox See Afolan.

MCPA amine, sodium salt, sodium potassium salt mixtures or ester. Controls several broadleaf weeds. See *Table 1 and Field Crops Chart.* Apply 1.25 to 1.7 L/ha of formulations containing 500 g/L MCPA in 100 L water when the crop is in the two leaf to early shot blade stage. For product volumes of other MCPA formulations refer to Table 10. If only wild mustard, lamb's-quarters and spring seedlings of stinkweed or flixweed are present, the rate of MCPA can be reduced to 840 mL/ha of formulations containing 500 g/L. For aerial recommendations see Table 8.

MCPAK (400 g/L) Controls hemp nettle and other MCPA susceptible weeds. See *Table 1 and Field Crops Chart.* Apply at 2.1 L/ha in 100 L water when the crop is in the three to six leaf stage and when the weeds are in the one to four leaf stage. Treat hemp nettle before the full four leaf stage. If buckwheat and smartweed are present, tank mix MCPAK at 1 L/ha with Banvel (400 g/L) at 275 mL/ha. Refer to Banvel recommendation. For aerial recommendations see Table 8.

NaTA TCA (85%), TCA Solution (568 g/L) Controls green and yellow foxtail. Apply 2 L/ha TCA solution or 1.34 kg/ha product NaTA TCA in 100 L water, when the crop is in the two to four leaf stage and the weeds have emerged. Some delay in barley maturity may occur but this will not affect yield. Since TCA acts primarily through the soil, there will be variations in control with different soil and moisture conditions. Avoid overlapping. Do not apply on barley seeded less than 5 cm deep. NaTA TCA may be tank mixed with MCPA amine, 2,4-D amine or Buctril M and TCA solution with MCPA ester or Buctril M to combine control of foxtail and susceptible broadleaf weeds. If 2,4-D is used in the mixture apply at the four leaf stage of the crop. Gradually pour NaTA TCA into the spray tank with agetator in operation. Ensure 10 litres or more of water is in the tank for each kilogram of material to be dissolved, prior to slowly pouring in the product. If 2,4-D or MCPA is used, add TCA to the tank first.

Pardner (225 g/L), Torch (227 g/L), or Torch DS (450 g/L) Controls several broadleaf weeds. *See Table 1 and Field Crops Chart.* Apply at 1.25 to 1.5 L/ha Pardner or Torch or 625 to 750 mL/ha Torch DS in 100 L water when weeds are at the two to four leaf stage and after the crop reaches the two leaf stage, but before it shields the weeds. Use the higher rate to improve control of more advanced weeds but before the weeds are past the six leaf stage. Wild mustard will not be controlled beyond the 3 leaf stage. If a wide range of leaf stages are present at the time of spraying a tank mix with MCPA or 2,4-D would be advisable to obtain adequate control of wild mustard. Pardner or Torch at 1.25 L/ha or Torch DS at 625 mL/ha may be tank mixed with MCPA or 2,4-D at 560 to 840 mL/ha of formulations containing 500 g/L MCPA or 2,4-D, Torch at 1.25 L/ha or Torch DS at 625 mL/ha may be mixed with 700 to 1100 mL/ha of MCPAK, to improve control of more advanced weeds. For product volumes of other MCPA or 2,4-D formulations see Table 10. Do not use 2,4-D mixture before the four leaf stage of barley.

Sabre see Brominal M.

Sencor see Lexone.

Stampede 360 (360 g/L) + MCPA ester Controls green and yellow foxtail and several broadleaf weeds. See *Table 1 and Field Crops Chart.* Apply 2.75 L/ha Stampede 360 in a tank mix with 550 mL/ha MCPA ester containing 500 g/L MCPA in 100 L/ha water. For product volumes of other MCPA formulations see Table 10. Apply at the one to four leaf stage of weeds when the majority of the foxtail is in the three leaf stage and less than 2.5 cm tall. The crop must be in the two to five leaf stage. Leaf discoloration and leaf tip burn may occur on the crop, particularly under dry conditions. Effects are temporary and new growth will be normal. Crop maturity may be affected under conditions of severe stress such as drought or flooding. For specific application instructions see the *Herbicide Information* section.

Stampede 360 is also registered for application without MCPA. Spectrum of broadleaved weeds controlled and effectiveness of green foxtail control will be reduced.

Stampede CM (460 g/L) Controls green and yellow foxtail and several broadleaf weeds. See *Table 1 and Field Crops Chart.* Apply 2.75 L/ha in 100 L water. Apply at the one to four leaf stage of weeds when the majority of the foxtail is in the three leaf stage and less than 2.5 cm tall. The crop must be in the two to five leaf stage. Leaf discoloration and leaf tip burn may occur on the crop, particularly under dry conditions. Effects are temporary and new growth will be normal. Crop maturity may be affected under conditions of severe stress such as drought or flooding. Refer to the *Herbicide Information* section for specific application instructions.

Target (400 g/L) Controls several broadleaf weeds. See *Table 1 and Field Crops Chart.* Apply 1 to 1.5 L/ha in 100 L water. Apply when barley is in the two to three leaf stage. Apply when weeds are actively growing and are in the two to three leaf stage. Use the higher rate if weeds are in the three to five leaf stage, under adverse weather conditions or when weed density is high.

TCA Solution see NaTA TCA

Torch See Pardner

Torch DS see Pardner.

Tordon 202C (212 g/L) Controls several broadleaf weeds. See *Table 1 and Field Crops Chart.* Apply 2.0 L/ha in 100 L water at the three to five leaf stage of barley. Some regrowth of Canada thistle may be expected in heavy infestations. Do not treat land to be seeded to a sensitive crop such as sunflowers, peas,

beans or legume forage crops within two years after treatment. Fallow or replant to wheat, barley, oats, flax or rapeseed for two years following treatment. See the Herbicide Information section for further precautions.

2,4-D amine or LV ester Controls several broadleaf weeds. See *Table 1 and Field Crops Chart.* Apply 1.25 to 1.7 L/ha of formulations containing 500 g/L 2,4-D in 100 L water when the crop is in the four leaf to early shot blade stage. For product volumes of other 2,4-D formulations, see Table 10. If only wild mustard, lamb's-quarters and spring seedlings of stinkweed or flixweed are present, the rate of 2,4-D can be reduced to 840 mL/ha of formulations containing 500 g/L 2,4-D. For aerial recommendations see Table 8.

For barley underseeded to forage crops see *Forage Crops* section.

Oats

Postemergence

Afolan F (450 g/L) or Lorox L (480 g/L) plus MCPA amine Controls several broadleaf weeds and gives suppression of green foxtail. See *Field Crops Chart.* Tank mix 470 to 620 mL/ha Afolan F with 1.1 L/ha MCPA amine (500 g/L) or 425 to 550 mL/ha of Lorox L with 840 to 1120 mL/ha MCPA amine (500 g/L). For product volumes of other MCPA amine formulations refer to Table 10. Apply in 100 L/ha water when the weeds are in the one to four leaf stage. Be sure to use 50 mesh screens in the filter and nozzles. Use the lower rates when growing conditions and rainfall are above average. Refer to *Herbicide Information* section for mixing instructions.

Banvel (400 g/L) Controls several broadleaf weeds. See *Field Crops Chart.* Apply at 275 to 350 mL/ha tank mixed with the amine, potassium, or sodium salt formulations of MCPA at 850 mL/ha of products containing 500 g/L MCPA. For product volumes of other MCPA formulations see Table 10. Use the higher rate if weeds are past the seedling stage (two to four leaf) and for cleaver control. Spray at the two to three leaf stage for optimum crop safety. Use a minimum spray volume of 110 L/ha. Do not treat after the five leaf stage of growth.

Blagal (375 g/L) Controls several broadleaf weeds. See *Field Crops Chart.* Apply 2.25 L/ha in 100 L water at a minimum pressure of 275 kPa. Blagal should be applied to actively growing weeds in the two to five true leaf stage (hemp nettle two to four leaf stage), and when the crop is in the two to four leaf stage. If the crop is under stress because of lack of moisture or extremes in temperature a temporary yellowing of the lower crop leaves may occur. However, the crop will recover with no adverse effects on yield. Refer to the Herbicide Information section for additional application instructions.

Brominal M (450 g/L), Bromox 450 M (450 g/L), Buctril M (450 g/L), Sabre (720 g/L) Controls several broadleaf weeds. *See Field Crops Chart.* Apply 1.25 L/ha Brominal M, Bromox 450 M or Buctril M or 780 mL/ha Sabre in 100 L water when weeds are in the two to four leaf stage. These treatments will give some top growth control of Canada thistle and perennial sowthistle but regrowth can be expected. Oats can be sprayed safely until the early shot blade stage. However, weeds will not be adequately controlled once the crop shields the weeds.

Brominal M and Bromox 450 M can be applied by air. See Table 8.

Bromox 450 M See Brominal M

Buctril M see Brominal M.

DyVel (420 g/L) Controls several broadleaf weeds. See *Field Crops Chart.* Apply at 1.25 L/ha in a minimum of 110 L of water. Spray at the two to three leaf stage for optimum crop safety. Do not treat after the five leaf stage of growth. Hemp nettle, corn spurry and cow cockle must be treated before the full four leaf stage.

Kil-mor (500 g/L) Controls several broadleaf weeds. See *Field Crops Chart.* Apply at 0.85 to 1.1 L/ha in 100 L water. For best results apply when weeds are actively growing and are in the two to three leaf stage. Use the higher rate if weeds are between the three to five leaf stage, under adverse weather conditions, or if weed density is high. Spray when the crop is in the three to four leaf stage.

Lorox see Afolan

MCPA amine, sodium salt, sodium potassium salt mixtures or ester. Controls several broadleaf weeds. See *Field Crops Chart.* Apply 1.25 to 1.7 L/ha of formulations containing 500 g/L MCPA in 100 L water when the crop is in the two leaf to early shot blade stage. For product volumes of other MCPA formulations refer to Table 10. If only wild mustard, lamb's-quarters and spring seedlings of stinkweed or flixweed are present, the rate of MCPA can be reduced to 840 mL/ha of formulations containing 500 g/L MCPA. For aerial recommendations see Table 8.

MCPAK (400 g/L) Controls hemp nettle and other MCPA susceptible weeds. See *Field Crops Chart.* Apply at 2.1 L/ha in 100 L of water when weeds are in the one to four leaf stage. Treat hemp nettle before the full four leaf stage. If buckwheat and annual smartweed species are present, tank mix MCPAK at 1 L/ha with Banvel (400 g/L) at 275 mL/ha. Refer to Banvel recommendation. For aerial recommendations see Table 8.

NaTA TCA (85%), TCA Solution (568 g/L) Controls green and yellow foxtail. Apply 2 to 3.75 L/ha TCA solution or 1.34 to 2.68 kg/ha product NaTA TCA in 100 L water, when the crop is in the two to four leaf stage and the weeds have emerged. Some delay in oat maturity may occur but this will not affect yield. Since TCA acts primarily through the soil, there will be variations in control with different soil and moisture

conditions. Avoid overlapping. Do not apply on oats seeded less than 5 cm deep. NaTA TCA may be tank mixed with MCPA amine and TCA solution with MCPA ester to combine control of foxtail and susceptible broadleaf weeds. Gradually pour NaTA TCA into the spray tank with the agetator in operation. Ensure 10 liters or more of water is in the tank for each kilogram of material to be dissolved, prior to slowly pouring in the product. If MCPA is used, add TCA to the tank first.

Pardner (225 g/L), Torch (227 g/L), Torch DS (450 g/L) Controls several broadleaf weeds. *See Field Crops Chart.* Apply at 1.25 to 1.5 L/ha of Pardner or Torch, or 625 to 750 mL/ha of Torch DS in 100 L of water when weeds are at the two to four leaf stage and after the crop reaches the two leaf stage but before it shields the weeds. Use higher rates to improve control of more advanced weeds but before the weeds are past the six leaf stage. Wild mustard will not be controlled beyond the three leaf stage. If a wide range of leaf stages are present at the time of spraying a tank mix with MCPA would be advisable to obtain adequate control of wild mustard. Pardner or Torch at 1.25 L/ha or Torch DS at 625 mL/ha may be tank mixed with MCPA at 560 to 840 mL/ha of formulations containing 500 g/L or Torch DS at 625 mL/ha with 700 to 1100 mL/ha MCPAK to improve control of more advanced weeds. For product volumes of various MCPA formulations see Table 10.

Sabre see Brominal M.

Stampede 360 (360 g/L) + MCPA ester Controls green and yellow foxtail and several broadleaf weeds. See *Field Crops Chart.* Apply 2.75 L/ha Stampede 360 in a tank mix with 550 mL/ha MCPA ester containing 500 g/L MCPA in 100 L/ha water. For product volumes of other MCPA formulations see Table 10. Apply at the one to four leaf stage of weeds when the majority of the foxtail is in the three leaf stage and less than 2.5 cm tall. The crop must be in the two to five leaf stage. Leaf discoloration and leaf tip burn may occur on the crop, particularly under dry conditions. Effects are temporary and new growth will be normal. Crop maturity may be affected under conditions of severe stress such as drought or flooding. For specific application instructions see the *Herbicide Information* section. Stampede 360 is also registered for application without MCPA. Spectrum of broadleaved weeds controlled and effectiveness of green foxtail control will be reduced.

Stampede CM (460 g/L) Controls green and yellow foxtail and several broadleaf weeds. See *Field Crops Chart.* Apply 2.75 L/ha in 100 L water. Apply at the one to four leaf stage of weeds when the majority of the foxtail is in the three leaf stage and less than 2.5 cm tall. The crop must be in the two to five leaf stage. Leaf discoloration and leaf tip burn may occur on the crop particularly under dry conditions. Effects are temporary and new growth will be normal. Crop maturity may be affected under conditions of severe stress such as drought or flooding.

Target (400 g/L) Controls several broadleaf weeds. See *Field Crops Chart.* Apply 1 to 1.5 L/ha in 100 L water. Apply when oats are in the two to five leaf stage. Apply when weeds are actively growing and are in the two to three leaf stage. Use the higher rate if weeds are in the three to five leaf stage, under adverse weather conditions or when weed density is high.

TCA Solution see NaTA TCA

Torch see Pardner

Torch DS see Pardner.

For oats underseeded to forage crops see Forage Crops Section.

Rye

Spring or Fall

Postemergence

Avenge 200 C (200 g/L) *(use on Cougar, Puma, Frontier, Rymin and Kodiak only)* Controls wild oats. Apply 3.5 to 4.25 L/ha in 100 L water. Use the higher rate when there are more than 200 wild oat plants per square meter. Nozzle tip pressure should be 276 kPa. Have nozzles spray at a 45° angle in direction of travel. Apply to a dry crop (no dew or rain) when wild oats are in the three to five leaf stage before crop is past the six leaf stage.

Avoid grazing or feeding for eight weeks after application. Do not apply if rain is forecast within six hours. Do not tank mix Avenge 200 C with broadleaf herbicides on rye. Refer to Herbicide Information section for additional instructions. For aerial recommendations see Table 8.

Banvel (400 g/L) *(spring rye only)* Controls several broadleaf weeds. *See Field Crops Chart.* Apply at 275 to 300 mL/ha tank mixed with the amine formulation of 2,4-D at 850 mL/ha containing 500 g/L 2,4-D. For product volumes of other 2,4-D formulations refer to Table 10. Use a minimum of 110 L/ha water. Spray at the two to three leaf stage for optimum crop safety. Do not treat after the five leaf stage of growth.

Hoe-Grass (190 g/L) Controls green and yellow foxtail, wild oats and barnyard grass. Apply 3.75 L/ha in at least 110 L water at a nozzle pressure of 275 kPa. Direct nozzles 45° forward. Apply when weeds are in the one to four leaf stage, and before they tiller. Allow an interval of at least four days after the application of Hoe-Grass when applying other herbicides. Do not apply if rain is expected within one hour. Refer to *Herbicide Information* section for additional instructions. For aerial recommendations see Table 8.

MCPA amine, sodium salt, sodium potassium salt mixtures or ester. Controls several broadleaf weeds. See *Field Crops Chart.* Apply 1.25 to 1.7 L/ha of formulations containing 500 g/L MCPA in 100 L water

when spring rye is in the two leaf to early shot blade stage, or when fall rye commences growth in the spring, until the early shot blade stage. For product volumes of other MCPA formulations refer to Table 10. If only wild mustard, lamb's-quarters and spring seedlings of stinkweed or flixweed are present reduce the rate of MCPA to 840 mL/ha of formulations containing 500 g/L MCPA. For aerial recommendations see Table 8.

2,4-D amine or LV ester Controls several broadleaf weeds. See *Field Crops Chart*. Apply 1.25 to 1.7 L/ha of formulations containing 500 g/L 2,4-D in 100 L water when the crop is in the four leaf to early shot blade stage. Only a few brands of 2,4-D are registered for application in the fall. For product volumes of other 2,4-D formulations refer to Table 10. If only wild mustard, lamb's-quarters and spring seedlings of stinkweed or flixweed are present, the rate of 2,4-D can be reduced to 840 mL/ha of formulations containing 500 g/L 2,4-D. For aerial recommendations see Table 8.

For rye underseeded to forage crops see Forage Crops section.

Triticale

Postemergence

Avenge 200 C (200 g/L) *(use on Welsh and Carman only)* Controls wild oats. Apply 3.5 to 4.25 L/ha in 100 L water. Use the higher rate when there are more than 200 wild oat plants per square meter. Nozzle tip pressure should be 276 kPa. Have nozzles spray at a 45° angle in direction of travel. Apply to a dry crop (no dew or rain) when wild oats are in the three to five leaf stage before crop is past 6 leaf stage. Avoid grazing or feeding for eight weeks after application. Do not apply if rain is forecast within six hours. Do not tank mix Avenge 200 C with broadleaf herbicides on triticale. Refer to Herbicide Information section for additional instructions. For aerial recommendations see Table 8.

Hoe-Grass (190 g/L) Controls green and yellow foxtail, wild oats and barnyard grass. Apply 3.75 L/ha in at least 110 L water at a nozzle pressure of 275 kPa. Direct nozzle 45° forward. Apply when weeds are in the one to four leaf stage, and before they tiller. Do not apply if rain is expected within one hour. For aerial recommendations see Table 8.

Hoe-Grass may be tank mixed with Torch at 1.25 L/ha or Torch DS at 625 mL/ha to control weeds susceptible to this product. Wild mustard will not be controlled beyond the three leaf stage. If a wide range of leaf stages are present at spraying wild mustard control may be variable.

Mataven (84 g/L) Controls wild oats. Apply 5 L/ha in 100 L water at a minimum nozzle pressure of 300 kPa when the majority of wild oats are in the three to six leaf stage. Do no apply to triticale after the six leaf stage. Refer to *Herbicide Information* section for additional instructions. For aerial recommendations see Table 8.

Pardner (225 g/L), Torch (227 g/L), Torch DS (450 g/L) Controls several broadleaf weeds. *See Field Crops Chart*. Apply 1.25 to 1.5 L/ha Pardner or Torch or 625 to 750 mL/ha Torch DS in 100 L water when weeds are in the two to four leaf stage and after triticale reaches the two leaf stage but before it shields the weeds, or reaches the early flag leaf stage. Use the higher rate to improve control of more advanced weeds but before the weeds are past the six leaf stage. Wild mustard will not be controlled beyond the three leaf stage. If a wide range of leaf stages are present at spraying wild mustard control may be variable.

TABLE 2. SUMMARY OF WHEAT RECOMMENDATIONS

See Table 15 for complete weed spectrum.

HERBICIDE	Barnyard grass	Foxtail, yellow & green	Wild oats	Buckwheat, wild	Catchfly, night flowering	Chickweed	Cleavers	Cow cockle	Cocklebur	Flixweed	Hemp nettle	Kochia	Lamb's quarters	Mustard, wild	Pigweed, red root	Russian thistle	Shepherd's purse	Smartweed, annual species	Stinkweed	Thistle, sow (perennial)	Thistle, Canada
Avadex BW			●																		
Avadex BW + Treflan EC		●	●																		
Treflan EC		●																			
Afolan or Lorox + MCPA		S		●		●		●	●	●	●	●	●	●	●		●	●	●	□	□
Avenge 200 C			●																		
Avenge 200 C + Brominal M or Buctril M or Bromox 450 M or Sabre			●	●				●	●	●		●	●	●	●	●	●	●	●	□[b]	□[b]
Avenge 200 C + MCPA ester or 2,4-D ester			●						●	●			●	●		●[d]	●		●	□	□
Avenge 200 C + Pardner or Torch or Torch DS			●	●				●	●			●	●	●	●	●		●	●		
Banvel + MCPA or 2,4-D				●	O		●	●	●	●	●[a]	●	●	●	●	●	●	●	●	□	□
Blagal				●		●				●	●		●	●	●		●	●	●	□	□
Brominal M, Bromox 450 M or Buctril M, Sabre				●				●	●	●		●	●	●	●	●	●	●	●	□[b]	□[b]
DyVel				●	O		●	●	●	●	●		●	●	●	●	●	●	●	□	□
Estaprop				●					●	●		●	●	●	●	●	●	●	●	□	□
Hoe-Grass	●	●	●																		
Hoe-Grass + Pardner or Torch or Torch DS	●	●	●	●				●	●			●	●	●	●	●		●	●		
Hoe-Grass II	●	●	●	●				●	●			●	●	●	●	●		●	●		
Kil-Mor				●	O		O	●	●	●		●	●	●	●	●	●	●	●	□	□
Lexone/Sencor					●	●					●		●	★	●	●		●	★		
Lexone/Sencor + MCPA or 2,4-D					●	●			●	●	●		●	●	●	●	●	●	●		
Lexone/Sencor + Banvel				●	●	●					●		●	●	●	●		●	●	□	□
Mataven			●																		
MCPA									★	★			★	★			★		★	□	□
MCPAK									★	★	●		★	★			★		★	□	□
Pardner/Torch/Torch DS				●				●	●			●	●	●	●	●		●	●		
Pardner/Torch/Torch DS + MCPA or 2,4-D				●				●	●	●		●	●	●	●	●[d]	●	●	●	□[b]	□[b]
Stampede 360		●		●									●		●		●	●	●[c]		
Stampede 360 + MCPA ester or 2,4-D		●		●					●	●			●	●	●	●[d]	●	●	●		
Stampede CM		●		●						●			●	●	●		●	●	●		
Target				●	O		O	●	O	●	S	O	●	●	●	●	●	●	●	□	□
Tordon 202 C				●					●				●	●	●	●		●	●	□	□
2,4-D									●	★			★	★		●	★		★	□	□

LEGEND

- ● Controlled by maximum rate recommended for wheat. Where two or more brand names are recommended, the weed may not appear on both labels.
- ★ Controlled by rates less than the maximum recommended for wheat.
- S Suppression.
- O Not labelled for control but adequate control can be expected.
- □ Top growth control only.
- [a] Use MCPAK for hemp-nettle control.
- [b] Regrowth can be expected.
- [c] Rosette stage only.
- [d] Use 2,4-D for Russian Thistle control.

Preplant, Preemergence incorporated

Avadex BW (400 g/L), Avadex BW Granular (10% G) Controls wild oats. Apply 3.5 L/ha or 15 kg/ha granular product in the fall or after seeding in the spring. Seed wheat below the treated layer. The granular formulation is more suited to fall applications and the liquid to spring applications. Apply liquid product in 100 L/ha water. The granular product should be applied with a suitable granular applicator. Refer to the Herbicide Information section for application and incorporation instructions.

Liquid product may be applied with liquid fertilizer as a carrier, or sprayed on dry urea fertilizer. See Herbicide Information section for incorporation instructions.

Avadex BW Granular may be applied by air. See Aerial Recommendations for Field Crops (Table 8).

Do not seed domestic oats the year after treatment with Avadex BW.

Avadex BW (400 g/L) plus Treflan EC (545 g/L) Controls wild oats, green and yellow foxtail. Apply at 3.5 L/ha Avadex plus 1.1 to 1.5 L/ha Treflan in at least 100 L water, after seeding but before crop emergence. Wheat must be seeded to a depth of 5 to 7.5 cm. Use the lower rate of Treflan on light sandy soils containing up to 6 per cent organic matter. Incorporate immediately after application (within eight hours) using a tyne or diamond harrow operated twice over the area at a speed of 8 km/h or greater. Both incorporations must be done within 24 hours of application. Apply only to a trash free surface. Treflan leaves a residue in the soil which may affect the subsequent crop. Refer to *Herbicide Information* section for susceptible crops.

Avadex BW plus Treflan EC (400 g/L) Refer to *Herbicide Information* section for Treflan rates equivalent to those in the previous recommendation. All other instructions remain the same.

Treflan EC (545 g/L) Controls green and yellow foxtail. Apply at 1.1 to 1.5 L/ha after seeding but prior to crop emergence. Use the lower rate on light sandy or medium textured soils up to 6 per cent organic matter. Apply in at least 100 L/ha water. Incorporate as soon as possible after application (within eight hours) with a tyne or diamond harrow operated twice over the area at a speed of 8 km/h or greater. Both incorporations must be done within 24 hours of application. Apply only to a trash free surface. Wheat must be seeded to a depth of 5 to 7.5 cm. Treflan leaves a residue in the soil which may affect the subsequent crop. Refer to *Herbicide Information* section for susceptible crops.

Postemergence

Afolan F (450 g/L) or Lorox L (480 g/L) plus MCPA amine Controls some broadleaf weeds and gives suppression of green foxtail. See *Table 2 and Field Crops Chart.* Tank mix 470 to 620 mL Afolan F with 1.1 L/ha MCPA amine (500 g/L) or 425 to 550 mL/ha of Lorox L with 840 to 1120 mL/ha MCPA amine (500 g/L). For product volumes of other MCPA amine formulations see Table 10. Apply in 100 L/ha water when the weeds are in the one to four leaf stage (green foxtail in the one to three leaf stage) and the crop is in the two to four leaf stage. Hemp nettle must be treated before the full four leaf stage. Be sure to use 50 mesh screens in the filter and nozzles. Use the lower rates if growing conditions and rainfall are above average. See *Herbicide Information* section for mixing instructions.

Avenge 200 C (200 g/L) *(Use on Neepawa, Glenlea, Selkirk, Chester, Macoun, Canuck and Benito only)* Controls wild oats. Apply 3.5 to 4.25 L/ha in 100 L water. Use the higher rate when there are more than 200 wild oat plants/square metre. Nozzle tip pressure should be 276 kPa. Have nozzles spray at a 45° angle in direction of travel. Apply to a dry crop (no dew or rain) when wild oats are in the three to five leaf stage. Avoid grazing for eight weeks after application. If rain is forecast within six hours do not apply. Also do not apply to wheat after the six leaf stage. Avenge may be tank mixed with MCPA ester, 2,4-D LV ester, Brominal M, Bromox 450 M, Buctril M, Pardner, Sabre, Torch or Torch DS. See *Herbicide Information* section for specific application instructions. For aerial recommendations see Table 8.

Banvel (400 g/L) Controls several broadleaf weeds. See *Table 2 and Field Crops Chart.* Apply 275 to 350 mL/ha tank mixed with the amine or potassium or sodium salt formulations of MCPA or amines of 2,4-D at 850 mL/ha of formulations containing 500 g/L MCPA or 2,4-D. For product volumes of other MCPA or 2,4-D formulations refer to Table 10. Use the higher rate if weeds are past the seedling stage (two to four leaf) and for cleaver control. Spray at the two to three leaf stage for optimum crop safety. Use a minimum spray volume of 110 L/ha water. Do not treat after the five leaf stage of growth.

Blagal (375 g/L) Controls several broadleaf weeds. See *Table 2 and Field Crops Chart.* Apply 2.25 L/ha in 100 L water at a minimum pressure of 275 kPa. Blagal should be applied to actively growing weeds in the two to five leaf stage (hemp nettle two to four leaf stage). If the crop is under stress (lack of moisture or extremes in temperature) a temporary yellowing of the lower crop leaves may occur. Wheat will recover with no adverse effects on yield. The *Herbicide Information* section contains additional application instructions.

Brominal M (450 g/L), Bromox 450 M (450 g/L), Buctril M (450 g/L), Sabre (720 g/L) Controls several broadleaf weeds. *See Table 2 and Field Crops Chart.* Apply 1.25 L/ha Brominal M, Bromox 450 M or Buctril M or 780 mL/ha Sabre in 100 L water when weeds are in the two to four leaf stage. Some top growth control of Canada thistle and perennial sow-thistle will result but regrowth can be expected. Wheat can be sprayed safely until the early shot blade stage but weeds will not be adequately controlled once the crop shields the weeds.

Brominal M and Bromox 450 M can be applied by air. See Table 8.

Bromox 450 M see Brominal M

Buctril M see Brominal M

Carbyne 2 EC (240 g/L) Carbyne is registered for wild oat control in wheat. See product label for application details. For best results Carbyne must be applied when wild oats are in the one to two leaf stage. Vigorous crop competition is necessary to supress the remaining wild oats. To improve control with Carbyne apply only at the higher registered rates of 1.5 to 1.75 L/ha.

DyVel (420 g/L) Controls several broadleaf weeds. See *Table 2 and Field Crops Chart.* Apply at 1.25 L/ha in a minimum of 110 L water. Spray at the two to three leaf stage for optimum crop safety. Do not treat after the five leaf stage of wheat. Hemp nettle, corn spurry and cow cockle must be treated before the full four leaf stage.

Estaprop (600 g/L) Controls several broadleaf weeds. See *Table 2 and Field Crops Chart.* Apply 1.75 L/ha in a minimum of 100 L water. Spray when wheat is in the four leaf to shot blade stage. Best control is obtained when the weeds are in the two to four leaf stage.

Hoe-Grass (190 g/L) Controls wild oats, green and yellow foxtail and barnyard grass. Apply at 3.75 L/ha in at least 110 L water with nozzles directed 45° forward. Apply when weeds are in the one to four leaf stage, and before they tiller. Hoe-Grass may be tank mixed with 1.25 L/ha Pardner or Torch or 625 mL/ha Torch DS to control weeds susceptible to these products. Wild mustard will not be controlled beyond the three leaf stage. If a wide range of leaf stages are present at the time of spraying a split application involving Hoe-Grass and another broadleaf herbicide would be advisable to obtain adequate control of wild mustard. When applying broadleaf herbicides other than Pardner or Torch, allow at least four days after the application of Hoe-Grass. Do not apply if rain is expected within one hour. Refer to *Herbicide Information* section for additional instructions. For aerial recommendations see Table 8.

Hoe-Grass II (310 g/L) Controls several grassy and broadleaf weeds. *See Table 2 and Field Crops Chart.* Apply 3.5 L/ha in not less than 110 L water with nozzles directed 45° forward. Apply when wild oats, green and yellow foxtail, and barnyard grass are in the one to four leaf stage and before tillering, when Russian thistle is up to 5 cm in height and when other broadleaf weeds are up to the early four leaf stage. Wild mustard will not be controlled beyond the three leaf stage. If a wide range of leaf stages are present at the time of spraying a split application involving Hoe-Grass and another broadleaf herbicide would be advisable to obtain adequate control of wild mustard. Do not apply Hoe-Grass II if rain is expected within one hour. Application of Hoe-Grass II by aircraft is not recommended.

Kil-mor (500 g/L) Controls several broadleaf weeds. See *Table 2 and Field Crops Chart.* Apply at 0.85 to 1.1 L/ha in 100 L water. For best results apply when weeds are actively growing and are in tl two to three leaf stage. Use the higher rate if weeds are between the three to five leaf stage, under adverse weather conditions, or if weed density is high. Spray when the crop is in the three to five leaf stage for maximum safety. Do not apply after the five leaf stage of wheat or if rain is expected within six hours.

Lexone DF (75%), Lexone L (480 g/L), Sencor 500 (500 g/L), Sencor 75 DF (75%) Controls several broadleaf weeds. *See Table 2 and Field Crops Chart.* Apply 275 g/ha product Lexone DF, 425 mL/ha product Lexone L, 425 mL/ha product Sencor 500 or 200 to 275 g/ha product Sencor 75 DF in 100 L water. Apply when wheat is in the two to five leaf stage. Use the higher rate when weed infestation is heavy and to improve residual control of chickweed.

Lexone or Sencor 500 may be tank mixed with 840 to 1120 mL/ha MCPA amine (500 g/L), or Sencor with 840 to 1120 mL/ha 2,4-D amine (500 g/L), to add control of top growth of Canada thistle and other MCPA, 2,4-D susceptible weeds. Apply at the three to four leaf stage of the crop.

Lexone or Sencor 500 may be tank mixed with 275 mL/ha Banvel (400 g/L) to add control of Canada thistle and wild buckwheat. Apply this tank mix when wheat is in the two to three leaf stage.

Sencor 500 at 275 mL/ha may be used to control stinkweed, volunteer rapeseed and wild mustard only. Can be tank mixed with 840 to 1120 mL/ha of 2,4-D amine or MCPA amine (500 g/L) or 275 mL/ha Banvel (400 g/L). For product volumes of other MCPA amine or 2,4-D amine formulations see Table 10.

Temporary (seven to ten days) lightening in crop color and a slight reduction in crop height may be observed, especially if frost or abnormally high temperatures occur within one to two days after application. Do not apply Lexone or Sencor for four to five days after a frost. Allow a four to five day interval between applications of Lexone or Sencor and wild oat herbicides. Avoid applying Sencor if rain is expected within six hours, or Lexone if rain is expected within two hours.

CAUTION: *Wheat must be planted at least 5 cm below the soil surface.*

Check *Herbicide Information* section for additional instructions.

Lorox see Afolan

Mataven (84 g/L) Controls wild oats. Apply 5 L/ha in 100 L water at a minimum nozzle pressure of 300 kPa when the majority of wild oats are in the three to six leaf stage. Do not apply to wheat after the six leaf stage. Do not apply to Selkirk wheat. Refer to *Herbicide Information* section for additional instructions. For aerial recommendations see Table 8.

MCPA amine, sodium salt, sodium potassium salt mixtures or ester Controls several broadleaf weeds. See *Table 2 and Field Crops Chart.* Apply 1.25 to 1.7 L/ha of formulations containing 500 g/L MCPA in 100 L water when wheat is in the two leaf to early shot blade stage. For product volumes of other MCPA formulations see Table 10. If only wild mustard, lamb's-

quarters and spring seedlings of stinkweed or flixweed are present, the rate of MCPA can be reduced to 840 mL/ha of formulations containing 500 g/L. For aerial recommendations see Table 8.

MCPAK (400 g/L) Controls hemp nettle and other MCPA susceptible weeds. See *Table 2 and Field Crops Chart.* Apply at 2.1 L/ha in 100 L of water when weeds are in the one to four leaf stage. Treat hemp nettle before the full four leaf stage. If buckwheat and annual smartweed species are present, tank mix MCPAK at 1 L/ha with Banvel (400 g/L) at 275 mL/ha. Refer to Banvel recommendation. For aerial recommendations see Table 8.

Pardner (225 g/L), Torch (227 g/L), Torch DS (450 g/L) Controls several broadleaf weeds. *See Table 2 and Field Crops Chart.* Apply 1.25 to 1.5 L/ha Pardner or Torch or 625 to 750 mL/ha Torch DS in 100 L water when weeds are in the two to four leaf stage and after wheat reaches the two leaf stage but before it shields the weeds. Use higher rates to improve control of more advanced weeds but before weeds are past the six leaf stage. Wild mustard will not be controlled beyond the three leaf stage. If a wide range of leaf stages are present at the time of spraying a tank mix with MCPA or 2,4-D would be advisable to obtain adequate control of wild mustard. Pardner or Torch at 1.25 L/ha or Torch DS at 625 mL/ha may be tank mixed with MCPA and 2,4-D formulations containing 500 g/L MCPA or 2,4-D, Torch at 1.25 L/ha or Torch DS at 625 mL/ha with 700 to 1100 mL/ha MCPAK, to improve control of more advanced weeds. For product volumes of various MCPA or 2,4-D formulations refer to Table 10. Do not use 2,4-D mixture before the four leaf stage of wheat.

Sabre see Brominal M

Sencor see Lexone

Stampede 360 (360 g/L) + MCPA ester Controls green and yellow foxtail and several broadleaf weeds. See *Table 2 and Field Crops Chart.* Apply 2.75 L/ha Stampede 360 in a tank mix with 550 mL/ha MCPA ester containing 500 g/L MCPA in 100 L/ha water. For product volumes of other MCPA formulations see Table 10. Apply at the one to four leaf stage of weeds when the majority of the foxtail is in the three leaf stage and less than 2.5 cm tall. The crop must be in the two to five leaf stage. Leaf discoloration and leaf tip burn may occur on the crop, particularly under dry conditions. Effects are temporary and new growth will be normal. Crop maturity may be affected under conditions of severe stress such as drought or flooding. For specific application instructions, see the *Herbicide Information* section. Stampede 360 is also registered for application without MCPA. Spectrum of broadleaved weeds controlled and effectiveness of green foxtail control will be reduced.

Stampede 360 (360 g/L) + 2,4-D amine or 2,4-D LV ester Controls green and yellow foxtail and several broadleaf weeds including Russian thistle. *See Table 2 and Field Crops Chart.* Apply 2.75 L/ha Stampede 360 in a tank mix with 800 to 1200 mL/ha 2,4-D LV ester (500 g/L) on spring wheat or 800 mL/ha 2,4-D LV ester on durum wheat, or with 1.2 L/ha 2,4-D amine on spring wheat and durum wheat. For product volumes of other 2,4-D formulations see Table 10. Add 2,4-D to spray tank prior to adding Stampede 360. Apply at the one to four leaf stage of weeds when the majority of the foxtail is in the three leaf stage and less than 2.5 cm tall. The crop must be in the three to five leaf stage. Leaf discoloration and leaf tip burn may occur on the crop, particularly under dry conditions. Effects are temporary and new growth will be normal. Crop maturity may be effected under conditions of severe stress such as drought or flooding. For specific application instructions, see the Herbicide Information section. Stampede 360 is also registered for application without 2,4-D amine or LV ester. Spectrums of broadleaf weeds controlled and effectiveness of green foxtail control will be reduced.

Stampede CM (460 g/L) Controls green and yellow foxtail and several broadleaf weeds. See *Table 2 and Field Crops Chart.* Apply 2.75 L/ha in 100 L water. Apply at the one to four leaf stage of weeds when the majority of the foxtail is in the three leaf stage and less than 2.5 cm tall. Wheat must be in the two to five leaf stage. Leaf discoloration and leaf tip burn may occur on the crop particularly under dry conditions. Effects are temporary and new growth will be normal. Crop maturity may be affected under conditions of severe stress such as drought or flooding. See *Herbicide Information* section for specific application instructions.

Target (400 g/L) Controls several broadleaf weeds. See *Table 2 and Field Crops Chart.* Apply 1 to 1.5 L/ha in 100 L water. Apply when wheat is in the two to five leaf stage. Apply when weeds are actively growing and are in the two to three leaf stage. Use the higher rate if weeds are in the three to five leaf stage, under adverse weather conditions or when weed density is high.

Torch see Pardner

Torch DS see Pardner

Tordon 202 C (212 g/L) Controls several broadleaf weeds. See *Table 2 and Field Crops Chart.* Apply 2.0 L/ha in 100 L water at the three to five leaf stage of wheat. Some regrowth of Canada thistle may be expected in heavy infestations. Do not treat land to be seeded to a sensitive crop such as sunflowers, peas, beans, or legume forage crops within two years after treatment. Fallow or replant to wheat, barley, oats, flax or rapeseed for two years following treatment. Further precautions are noted in the *Herbicide Information* section.

2,4-D amine or LV ester Controls several broadleaf weeds. See *Table 2 and Field Crops Chart.* Apply 1.25 to 1.7 L/ha of formulations containing 500 g/L 2,4-D in 100 L water when wheat is in the four leaf to early shot blade stage. For product volumes of other 2,4-D formulations, check Table 10. If only wild mustard, lamb's-quarters and spring seedlings of stinkweed or flixweed are present, the rate of 2,4-D can be reduced

to 840 mL/ha of formulations containing 500 g/L 2,4-D. For aerial recommendations see Table 8.

For wheat underseeded to forage crops see *Forage Crops* section.

Winter Wheat

Before planting

It is recommended that winter wheat be planted into standing stubble to improve winter survival. Select a field which is relatively free of perennial weeds such as quackgrass, Canada thistle and dandelions as these weeds will flourish in the absence of tillage.

Annual weeds, including volunteer crops generally do not warrant chemical control in the fall, as densities are low and plants will winter-kill. If necessary to spray, see Zero Tillage recommendations.

Fall applications

Winter annual weeds such as stinkweed, flixweed and shepherd's purse may establish in the fall. Fall applications of 2,4-D have been tested but are not registered for use.

Spring applications

Winter wheat competes strongly with spring germinating weeds and generally chemical control is not required. Wild oats may be a problem in thin winter wheat crops or in patches where winter kill has occurred.

Avenge 200 C (200 g/L) *(Norstar and Sundance only)* Controls wild oats. Apply 3.5 to 4.25 L/ha in 100 L water. Use the higher rate when there are more than 200 wild oat plants per square meter. Nozzle tip pressure should be 276 kPa. Have nozzles spray at 45° angle in direction of travel. Apply to a dry crop (no dew or rain) when wild oats are in the three to five leaf stage before crop is past six leaf stage. Avoid grazing or feeding for eight weeks after application. Do not apply if rain is forecast within six hours. Do not tank mix Avenge 200 C with broadleaf herbicides on winter wheat. Refer to Herbicide Information section for additional instructions. For aerial recommendations see Table 8.

Banvel (400 g/L) Controls several broadleaf weeds. See *Field Crops Chart.* Apply 275 to 350 mL/ha tank mixed with the amine or potassium or sodium salt formulations of MCPA or amines of 2,4-D at 850 mL/ha of formulations containing 500 g/L MCPA or 2,4-D. For product volumes of other MCPA or 2,4-D formulations refer to Table 10. Use the higher rate if weeds are past the seedling stage (two to four leaf) and for cleaver control. Apply when the crop is 15 cm tall, before the shot blade stage. Use a minimum spray volume of 110 L/ha water.

Buctril M (450 g/L) Controls several broadleaf weeds. See *Field Crops Chart.* Apply 1.25 L/ha in 100 L water when weeds are in the two to four leaf stage. Winter wheat can be sprayed safely until the early shot blade stage but weeds will not be adequately controlled once the crop shields the weeds. Some top growth control of Canada thistle and perennial sow thistle will result but regrowth can be expected.

Estaprop (600 g/L) Controls several broadleaf weeds. See *Field Crops Chart.* Apply 1.75 L/ha in a minimum of 100 L water. Spray winter wheat after full tillering but before the shot blade stage. Best control is obtained when weeds are in the two to four leaf stage.

Hoe-Grass (190 g/L) Controls wild oats, green and yellow foxtail and barnyard grass. Apply 3.75 L/ha in at least 110 L water with nozzles directed 45° forward. Apply when weeds are in the one to four leaf stage, and before they tiller. Allow an interval of at least four days after the application of Hoe-Grass before applying broadleaf herbicides. Do not apply if rain is expected within one hour. Refer to *Herbicide Information* section for additional instructions.

Kil-Mor (500 g/L) Controls several broadleaf weeds. See *Field Crops Chart.* Apply 850 to 1100 mL/ha in 100 L water when weeds are actively growing and small. Use the higher rate if weeds are between the three to five leaf stage, under adverse weather conditions, or if weed density is high. Winter annual weeds should be sprayed early while they are in the rosette stage. Spray before the crop is more than 30 cm high (top leaf extended). Do not apply if rain is expected within six hours.

Mataven (84 g/L) Controls wild oats. Apply 5 L/ha in 100 L water at a minimum nozzle pressure of 300 kPa when the majority of wild oats are in the three to six leaf stage. Do not apply to winter wheat after the six leaf stage. Refer to *Herbicide Information* section for additional instructions. For aerial recommendations see Table 8.

MCPA amine, sodium salt, sodium potassium salt mixtures or ester. Controls several broadleaf weeds. See *Field Crops Chart.* Apply 1.25 to 1.7 L/ha of formulations containing 500 g/L MCPA in 100 L water. For product volumes of other MCPA formulations see Table 10. Apply in spring from the time winter wheat commences growth until the early shot blade stage. If only wild mustard, lamb's quarters and spring seedlings of stinkweed or flixweed are present, the rate of MCPA can be reduced to 840 mL/ha of formulations containing 500 g/L. For aerial recommendations see Table 8.

Pardner (225 g/L) Controls several broadleaf weeds. See *Field Crops Chart.* Apply 1.25 to 1.5 L/ha in 100 L water when weeds are in the two to four leaf stage. Use the higher rate to improve control of more advanced weeds but before the weeds are past the six leaf stage. Winter wheat can be sprayed safely until the early shot blade stage but weeds will not be adequately controlled once the crop shields the weeds.

Pardner at 1.25 L/ha may be tank mixed with MCPA or 2,4-D at 560 to 840 mL/ha of formulations containing 500 g/L MCPA or 2,4-D, to improve control of more

advanced weeds. For product volumes of other MCPA or 2,4-D formulations refer to Table 10.

2,4-D amine or LV ester Controls several broadleaf weeds. See *Field Crops Chart.* Apply 1.25 to 1.7 L/ha of formulations containing 500 g/L 2,4-D in 100 L water. For product volumes of other 2,4-D formulations see Table 10. Apply in spring after winter wheat is fully tillered but before the early shot blade stage. If only wild mustard, lamb's quarters and spring seedlings of stinkweed or flixweed are present, the rate of 2,4-D can be reduced to 840 mL/ha of formulations containing 500 g/L. For aerial recommendations see Table 8.

Other field crops

Beans, Dry

To provide broad spectrum weed control it is generally necessary to use a preplant incorporated herbicide plus a preemergence or postemergence herbicide. The following herbicides are recommended for use on navy, black and pinto beans only.

Preplant Incorporated

Eptam 8-E (800 g/L), Eptam 10 G (10%) Controls several grassy and broadleaf weeds. See *Field Crops Chart.* Apply in the spring at 4.25 to 5.5 L/ha or 34 to 45 kg/ha granular product. Liquid should be applied on a dry soil surface in at least 100 L/ha water. Use a suitable granular applicator for the granular product. Incorporate immediately following instructions in *Herbicide Information* section.

Eptam 8-E may be applied with liquid fertilizer, or on granular fertilizer. See the *Herbicide Information* section for specific instructions regarding application and use on dry fertilizer.

Treflan EC (545 g/L) Controls wild oats, green and yellow foxtail and several broadleaf weeds. See *Field Crops Chart.*

Spring application

Apply 1.5 to 2.6 L/ha as a preplant application in at least 100 L water. To incorporate, follow instructions in *Herbicide Information* section.

Fall application

Apply 2.0 to 3.0 L/ha in at least 100 L water. Apply between September 1 and freeze-up. Incorporate according to instructions in *Herbicide Information* section.

Treflan leaves a residue in the soil which may affect subsequent crops. See *Herbicide Information* section for susceptible crops.

Preemergence

Premerge 360 (360 g/L), Sinox PE (360 g/L) Controls wild mustard, stinkweed and volunteer rapeseed. Apply at 17 to 22 L/ha in 250 to 400 L water. Apply at planting or shortly after, but before the crop emerges.

CAUTION: *Use rubber gloves, goggles and an agricultural respirator when handling Premerge 360 or Sinox PE.*

Emergence (Crook Stage)

Premerge 360 (360 g/L), Sinox PE (360 g/L), Yellow Stuff PE (360 g/L) Controls wild mustard, stinkweed, and volunteer rapeseed. Apply at 8 to 14 L/ha in 250 to 400 L water. Apply at emergence or shortly after, but not beyond the crook stage. Late application will result in delayed maturity and yield reduction.

CAUTION: *Use rubber gloves, goggles and agricultural respirator when handling Premerge 360, Sinox PE, Yellow Stuff PE.*

Sinox PE see Premerge 360

Yellow Stuff see Premerge 360

Postemergence

Basagran (480 g/L) Controls several broadleaf weeds. See *Field Crops Chart.* Apply 1.75 to 2.25 L/ha in 200 to 400 L water. Apply to beans after the first trifoliolate leaf stage. Use the lower rate to control lady's thumb and annual smartweed species 2.5 to 7.5 cm high, wild mustard 2.5 to 12.5 cm high, or cocklebur 7.5 to 17.5 cm high. Use the higher rate to control lady's thumb and annual smartweed species 7.5 to 20 cm high, wild mustard 12.5 to 25 cm high, cocklebur 17.5 to 30 cm high, and seedlings of other susceptible weeds. The addition of Citowett Plus at 2.5 L/1000 L or Assist Oil Concentrate at 5 to 10 L/1000 L spray mixture will improve the control of advanced weeds. Best results are obtained if Basagran is applied under higher temperature conditions (21°C).

Hoe-Grass (190 g/L) Controls wild oats, green and yellow foxtail, barnyard grass. Apply 5.25 L/ha in 110 L water with a nozzle pressure of 275 kPa. Direct nozzles 45° forward. Apply at one to four leaf stage of the weeds, before they tiller. See *Herbicide Information* section for application instructions. Do not apply Hoe-Grass if rain is expected within one hour.

Buckwheat

Postemergence

Basfapon (74%) Controls green and yellow foxtail. Apply 550 to 850 g/ha product in 100 L water. Spray when the crop is in the one to three leaf stage. Do not graze or feed to dairy cows or animals being finished for slaughter.

Hoe-Grass (190 g/L) Controls wild oats, green and yellow foxtail, barnyard grass. Apply 3.75 L/ha in 110 L water with a nozzle pressure of 275 kPa. Direct nozzles 45° forward. Apply at one to four leaf stage of the weeds, before they tiller. See *Herbicide Information* section for application instructions. Do not apply Hoe-Grass if rain is expected within one hour.

Canary Seed

Postemergence

Avenge 200 C (200 g/L) Controls wild oats. Apply 3.5 to 4.25 L/ha in 100 L water. Use the higher rate when there are more than 200 wild oat plants per square metre. Nozzle tip pressure should be 276 kPa. Have nozzles spray at a 45° angle in direction of travel. Apply to a dry crop (no dew or rain) when wild oats are in the three to five leaf stage. Avoid grazing for eight weeks after application. Do not apply if rain is forecast within six hours or after the six leaf stage of the crop. For specific application instructions see the *Herbicide Information* section. For aerial recommendations see Table 8.

Banvel (400 g/L) Controls several broadleaf weeds. *See Field Crops Chart.* Apply 350 mL/ha Banvel tank mixed with 850 mL/ha of MCPA amine formulations containing 500 g/L MCPA. For product volumes of other MCPA formulations refer to Table 10. Apply in 110 L/ha of water when canary seed is in the three to five leaf stage.

Brominal M (450 g/L), Bromox 450 M (450 g/L), Buctril M (450 g/L), Sabre (720 g/L) Controls several broadleaf weeds. See *Field Crops Chart.* Apply Brominal M, Bromox 450 M or Buctril M at 1.25 L/ha or Sabre at 780 mL/ha in 100 L water when weeds are in the two to four leaf stage, and canary seed is in the three to five leaf stage. Some top growth control of Canada thistle and perennial sow thistle will result but regrowth can be expected.

Bromox 450 M see Brominal M

Buctril M see Brominal M

Matavan (84 g/L) Controls wild oats. Apply 5 L/ha in 100 L water at a minimum nozzle pressure of 300 kPa when the majority of the wild oats are in the three to six leaf stage. Do not apply to canary seed after the six leaf stage. Refer to *Herbicide Information* section for additional instructions. For aerial recommendations see Table 8.

Pardner (225 g/L), Torch (227 g/L), Torch DS (450 g/L) Controls several broadleaf weeds. See *Field Crops Chart.* Apply 1.25 L/ha of Pardner or 1.25 to 1.5 L/ha of Torch or 625 to 750 mL/ha of Torch DS in 100 L water when canary seed is in the three to five leaf stage and weeds are in the two to four leaf stage. Use the higher rate of Torch to improve control of more advanced weeds but apply before the weeds are past the six leaf stage. Wild mustard will not be controlled beyond the three leaf stage. If a wide range of leaf stages is present at the time of spraying another broadleaf herbicide should be considered to obtain adequate control of wild mustard.

Sabre see Brominal M

Torch, Torch DS see Pardner

TABLE 3. HERBICIDES FOR CORN

WEEDS / HERBICIDES	Aatrex Plus Atra-Mix [a] Atrazine plus oil	Basagran	Banvel®	Banvel plus 2,4-D amine[b]	Blazer®[c]	Blazer® / Bio-Veg	Blazer® + Dual	Blazer® + Eradicane	Blazer® + Sutan +	Buctril M	Dual	Eradicane	Eradicane plus Atrazine[a]	Kil-Mor[b]	Laddok	Lasso	Pardner, Torch, Torch DS	Primextra®	Sutan +	Sutan + plus Atrazine[a]	2,4-D[b]
Barnyard Grass	●				●	●	●	●	●		●	●	●		●	●	●	●	●	●	
Cereal Grains	O				●	●							S								
Foxtail, Green	●				●	●	●	●	●		●	●	●		●	●	●	●	●	●	
Foxtail, Yellow	●				●	●	●	●	●		●	●	●		●	●	●	●	●	●	
Wild Oats	●												S								
Quack Grass	S[d]											S	S								
Bindweed, Field		●[g]	□	□										□							□
Blue Bur				●						●				○	●						●
Buckwheat, Volunteer	O			○						●				●	●						
Buckwheat, Tartary			●	●						●				●	●						
Buckwheat, Wild	●		●	●	●	●	●	●	●	●			○	●	●				●	●	
Burdock				●										○	○						●
Catchfly, Night-flowering				○									S								
Chickweed		●														●					
Cleavers			●	●										○	●						
Cockle, Cow			●	●						●				●	●						
Cocklebur		●		●						●				●	●						●
Corn Spurry			●	●																	□
Dandelion																					
Flixweed				●						●				●	●						●
Galinsoga, Hairy																					●
Goat's-beard																					●
Goosefoot, Oakleaved																					●
Henbit																					
Knotweed, Prostrate				○										●							
Kochia	O			○						●				●							
Lamb's-Quarters	●	●	●	●	●	●	●	●	●	●			○	●	●		●				
Lettuce, Prickly																					●
Mustard, Ball	●	●		●						●				●	●						●
Mustard, Dog	●	●		●										●	●						●
Mustard, Hare's-ear	●	●		●										●	●						●
Mustard, Indian	●	●		●						○				●	●						●
Mustard, Tame	●	●		○						○				○	●						●
Mustard, Tumble	●	●		●						●				●	●						●
Mustard, Wild	●	●	●	●	●	●	●	●	●	●			●	●	●		●				●
Mustard, Wormseed	●				●	●	●	●	●	●				●	●						●
Nightshade																					
Pigweed, Prostrate				●						○											
Pigweed, Red Root	●	●	●	●	●	●	●	●	●	●			●	●	●		●				●
Pigweed, Russian				●										●	○						●
Pigweed, Tumble																					●
Purslane	●	●		●						●				●	●						●
Radish, Wild				●										●	●						●
Ragweed, Common	●	●	●	●	●	●	●	●	●	●			●	●	●		●				●
Ragweed, False	●	●		●						●				●	●						●
Ragweed, Giant	●	●		●						●				●	●						●
Rapeseed, Volunteer	O			○						●				●	○						○
Russian-thistle	●	●		●						●				●	●						●
Shepherd's Purse	●	●		●						●				●	●						●
Annual Smartweed Species, Lady's Thumb	●	●	●	●	●	●	●	●	●	●			●	●	●		●				●
Sow Thistle (Annual)				●						○				●	●						●
Sow Thistle (Perennial)				□										□	□						□
Spurge, Thyme-leaved																					
Stinkweed	O			●						●				●	●						●
Sunflower, Prairie				○						○				○	●						●
Sunflower, Volunteer				○						●				○	●						●
Sweet Clover, White	●			●										●	●						●
Thistle, Canada		●[g]	□	□										□	□						□

LEGEND

● controlled by rates recommended for corn. Where two or more brand names are recommended, the weed may not appear on all labels.

O Not labelled for control but adequate control can be expected.

S Suppression

□ top growth control only

[a] These treatments may remain as a residue in the soil the following year. Flax, peas and fababeans are more tolerant crops. See comments in corn section for specific instructions.

[b] Apply as an overall spray until corn is 15 cm tall with leaf outstretched. After this stage use a directed spray. When using the 1.7 L/ha rate of formulations containing 500 g/L 2,4-D, use only as a directed spray to avoid crop injury. For equivalent product volumes of other 2,4-D formulations see Table 10.

[c] Use a split application of 4.5 L/ha of liquid formulations containing 500 g/L atrazine or 2.5 kg/ha of wettable powder formulations containing 90 percent atrazine, preplant incorporated, followed by the same rate of atrazine with oil early postemergence. For equivalent weights or volumes of other atrazine formulations see Table 9. See product label for application instructions.

[d] Split applications required for adequate control.

[e] Use under irrigated conditions only.

[f] Apply postemergence. Use Blazer 80 W only.

[g] Apply as an overall spray until corn is 30 cm tall with leaf outstretched. After this stage use a directed spray.

CAUTION: *Any treatments containing atrazine leave a residue in the soil which may affect the subsequent crop. For rotational corn, non-residual treatments are preferred to allow cropping flexibility. Flax, peas and fababeans are more tolerant and are usually not affected by rates of up to 1.1 kg/ha active atrazine applied in the previous crop year. If rates exceed 1.1 kg/ha active, then atrazine may affect these tolerant crops the following year, and more susceptible crops may be affected for two to three years after application. Corn is recommended to follow these higher rates of atrazine.*

Bladex may leave a residue in the soil. Plant only corn, cereals, potatoes, flax, rapeseed (Canola), sunflowers, soybeans or peas the year following Bladex application. Carryover will be greater on heavier textured soils and under dry conditions. Residue carryover following repeated applications of Bladex (two or more consecutive years) has not been fully evaluated and could result in damage to more sensitive crops such as rapeseed (Canola), sunflowers or cereals.

To reduce the levels of residue in the soil, atrazine or Bladex may be applied in a band instead of as a broadcast treatment, so the overall rate of application is reduced. Thorough mixing of the treated soil after the cropping year will result in a reduction of the residue problem.

Proso millet is becoming an increasing problem in corn, especially where continuous corn production is practiced. Eradicane has some activity in suppressing proso millet but there are problems with late germination of proso millet and with reduced control on soils receiving repeated applications of Eradicane. Bladex applied as a tank mixture with Eradicane or applied as an early postemergence treatment on land treated prior to planting with Eradicane may improve suppression of proso millet by Eradicane. These treatments will not be effective if applied to land treated with Eradicane, Sutan or Eptam the previous year. Research is underway to evaluate the effectiveness of various herbicide combinations in controlling proso millet.

Preplant incorporated

Bladex L (480 g/L), Bladex 80 W (80%) and Dual (950 g/L) Controls several grassy and broadleaf weeds. *See Table 3.* Apply Bladex L at 4.25 to 5.0 L/ha or Bladex 80 W at 2.5 to 3.0 kg/ha in combination with Dual at 2.0 to 2.75 L/ha. Apply in 150 L/ha water and incorporate in the top 5 cm of soil with a tandem disc, vibrating shank cultivator or harrows set to work the soil no deeper than 10 cm. Immediate incorporation is not required. Use the lower rates on light soils and the higher rates on medium textured and high organic matter soils. Do not use on peat or muck soils. Do not use on soils with less than one percent organic matter. Bladex may leave a residue in the soil. See caution note at beginning of the corn section.

Bladex L (480 g/L), Bladex 80 W (80%) and Eradicane 8-E (800 g/L) Controls several grasses and broadleaf weeds. See Table 3. Apply Bladex L at 4.25 to 5.0 L/ha or Bladex 80 W at 2.5 to 3.0 kg/ha in combination with 4.25 to 8.5 L/ha of Eradicane 8-E in 100 L water to the dry soil surface of a well prepared seedbed. Spray and incorporate immediately. Refer to the *Herbicide Information* section for incorporation instructions. Use the lower rate of Bladex on light textured soils. Do not use on soils with less than one percent organic matter. Do not use on soils treated with Eradicane, Eptam or Sutan the previous year. Bladex may leave a residue in the soil. See caution note at the beginning of the corn section.

Bladex L (480 g/L), Bladex 80 W (80%) and Sutan + (800 g/L) Controls several grasses and broadleaf weeds. See Table 3. Apply Bladex L at 4.25 to 5.0 L/ha or Bladex 80 W at 2.5 to 3.0 kg/ha in combination with 4.25 to 5.5 L/ha of Sutan + in 100 L water to the dry soil surface of a well prepared seedbed and incorporate immediately. See the *Herbicide Information* section for incorporation instructions. Use the lower rate of Bladex on light textured soils and the higher rate on medium textured soils. Do not use on soils with less than one percent organic matter. Do not use on soils treated with Eptam, Eradicane or Sutan the previous year. Bladex may leave a residue in the soil. See the caution note at the beginning of the corn section.

Dual (960 g/L) Controls green and yellow foxtail and barnyard grass. Apply 2.0 to 2.75 L/ha in a minimum of 150 L of water. Incorporate in the top 5 cm of soil with a tandem disc, vibrating shank cultivator or harrows, set to work the soil no deeper than 10 cm. Immediate incorporation is not required. Do not use on peat or muck soils. Dual-Ciba-Geigy may be tank mixed with Aatrex or Atrazine. Incorporation instructions are given in the *Herbicide Information* section. Heavy rainfall following application may result in reduced weed control, especially on sandy soils.

Eradicane 8-E (800 g/L) Controls several grasses and broadleaf weeds. (Table 3) Apply 4.25 to 8.5 L/ha in a minimum of 100 L water to the dry soil surface of a well prepared seedbed. Spray and incorporate immediately. Refer to *Herbicide Information* section for incorporation instructions. Eradicane 8-E may be applied with liquid fertilizer or on dry fertilizer. Refer to the *Herbicide Information* section for application and incorporation instructions. Use the 8.5 L/ha rate to control quack grass. Cut the underground rhizomes of quack grass thoroughly so that four or less nodes remain on the strand. Follow Eradicane application with a recommended postemergent herbicide to control broadleaf weeds if necessary.

CAUTION: *The level of weed control will be reduced where Eradicane is used on soils which have been treated with Eradicane or Eptam or Sutan + the previous growing season. It is anticipated that the reduction in control will be greater where Eradicane, Eptam or Sutan + has been used repeatedly for two or more years.*

Eradicane 8-E (800 g/L) plus Atrazine Controls several grasses and broadleaf weeds (Table 3). Apply 4.25 to 5.5 L/ha Eradicane and 2.3 to 3.6 L/ha of liquid atrazine formulations containing 500 g/L atrazine or 1.3 to 2.0 kg/ha of wettable powder formulations con-

taining 90% atrazine. For product weights or volumes of other atrazine formulations see Table 9. Use the higher rates on soils containing more than four percent organic matter. Eradicane 8-E plus atrazine may be applied with liquid fertilizer or on dry fertilizer. See the *Herbicide Information* section for application and incorporation instructions. This combination may leave a residue in the soil. See caution note at the beginning of the corn section.

Lasso (480 g/L) Controls green and yellow foxtail. Apply 7.5 to 9.5 L/ha in a miminum of 150 L water. Incorporate in the top 5 cm of soil with a tandem disc working at 7.5 to 10 cm followed by a harrow. Field cultivators or harrows may be used for incorporation on lighter soils. Immediate incorporation is not necessary. Do not use on peat or muck soils. Lasso may be tank mixed with Atrazine. See the *Herbicide Information* section for additional information.

Primextra (500 g/L) Controls green and yellow foxtail, barnyard grass and several broadleaf weeds. (Table 3) Apply 6.7 to 8.5 L/ha in a minimum of 150 L water. Use the higher rate for heavy weed infestations. Incorporate thoroughly into the top 5 cm of soil prior to planting. Immediate incorporation is not necessary. Refer to *Herbicide Information* section for incorporation instructions. Heavy rainfall following application may result in reduced weed control, especially on sandy soils. This product may leave a residue in the soil. See caution note at the beginning of the corn section.

Sutan+ (800 g/L) Controls green and yellow foxtail and barnyard grass. Apply 4.25 to 5.5 L/ha in a minimum of 100 L water to the dry soil surface of a well prepared seedbed. Sutan+ may be applied with liquid fertilizer or on dry granular fertilizers. See the *Herbicide Information* section for specific instructions regarding application and use on dry fertilizer. Follow Sutan+ application with a recommended postemergent herbicide to control broadleaf weeds if necessary. Under cool soil conditions, Sutan + should be tank mixed with atrazine or Bladex.

CAUTION: *The level of weed control will be reduced where Sutan is used on soils which have been treated with Eradicane, Eptam or Sutan the previous growing season. It is anticipated that the reduction in control will be greater where these herbicides have been used repeatedly for two or more years.*

Sutan+ (800 g/L) and Atrazine Controls several grasses and broadleaf weeds. (Table 3) Apply 4.25 to 5.5 L/ha Sutan+ and 2.25 L/ha of liquid formulations containing 500 g/L atrazine or 1.25 kg/ha of wettable powder formulations containing 90 percent atrazine as a tank mix in a minimum of 100 L water. For product weights or volumes of other Atrazine formulations see Table 9. Apply to the dry soil surface of a well prepared seedbed. Spray and incorporate immediately. Refer to *Herbicide Information* section for incorporation instructions. This combination may leave a residue in the soil. See caution note at the beginning of the corn section. Sutan+ plus atrazine may be applied with liquid fertilizer or on dry granular fertilizers. See the *Herbicide Information* section for specific instructions regarding application and use on dry fertilizer.

Preemergence

The following herbicides are recommended for preemergence application under irrigated conditions only.

Aatrex Liquid, Aatrex Nine-O, Aatrex 90W, Atrazine 500, Atrazine 80W, Atrazine 90W Controls wild oats, and several broadleaf weeds. See Table 3. Apply 4.5 to 6.75 L/ha of liquid formulations containing 500 g/L or 2.5 to 3.35 kg/ha of wettable powder formulations containing 90 percent atrazine after seeding but before crop or weed emergence. For equivalent weights or volumes of other atrazine formulations see Table 9. Rain or irrigation of at least 1.25 cm is required within seven days following application for satisfactory results. May be tank mixed with Bladex, Dual or Lasso. Apply 2.5 L/ha of liquid atrazine formulations containing 500 g/L atrazine or 1.25 kg/ha of wettable powder formulations containing 90 percent atrazine tank mixed with 4.75 L/ha of Bladex liquid or 2.75 kg/ha of Bladex 80W or with 2.0 to 2.75 L/ha of Dual or with 6.0 to 8.0 L/ha of Lasso. Atrazine products may leave a residue in the soil. See caution note at the beginning of the corn section.

Bladex (480 g/L), Bladex 80W (80%) Controls green and yellow foxtail, barnyard grass, and several broadleaf weeds. See Table 3. Apply 4.75 to 5.0 L/ha of Bladex liquid or 2.75 to 3.0 kg/ha of Bladex 80W in 150 to 300 L water prior to crop and weed emergence. Use the higher rate on sandy loam soils. Use only on sandy and sandy loam soils. Do not use on soils containing less than one percent organic matter or on soils containing more than 70 percent sand. Rain or irrigation of at least 1.25 cm is required within 7 days following application for satisfactory results. Bladex leaves a residue in the soil which may affect subsequent crops. See the caution note at the beginning of the corn section. Bladex may be tank mixed with atrazine products, Dual or Lasso.

Dual (960 g/L) Controls green and yellow foxtail and barnyard grass. Apply 2.0 to 2.75 L/ha in a minimum of 150 L of water after planting but prior to crop and weed emergence. Rain or irrigation of at least 1.25 cm is required within 10 days following application for satisfactory results. Do not use on peat or muck soils. Heavy rainfall or excessive irrigation following application may result in reduced weed control, especially on sandy soils. Dual may be tank mixed with atrazine products or Bladex.

Lasso (480 g/L) Controls green and yellow foxtail. Apply 6.0 to 8.0 L/ha in a minimum of 150 L water after planting but prior to crop and weed emergence. Rainfall or irrigation of 0.8 to 1.8 cm is required within seven days following application for satisfactory results. Heavy rainfall or excessive irrigation following application may result in reduced weed control, especially on sandy soils. Do not use on peat or muck

soils. Lasso may be tank mixed with atrazine products or Bladex.

Primextra (500 g/L) Controls green and yellow foxtail, barnyard grass and several broadleaf weeds. See Table 3. Apply 6.7 to 8.5 L/ha in a minimum of 150 L water after seeding but before crop or weed emergence. Use the higher rate for heavy weed infestations. Rain or irrigation of at least 1.25 cm is required within seven days following application for satisfactory results. This product contains atrazine and may leave a residue in the soil. See the caution note at the beginning of the corn section.

Postemergence

Aatrex Liquid, Aatrex Nine-O, Aatrex 90 W, Atrazine Flowable, Atrazine 80 W, Atrazine 90 W, and Oil (Non-Herbicidal) or Oil Concentrate Controls wild oats, seedling green and yellow foxtail, and several broadleaf weeds (Table 3). Apply 4.5 to 6.75 L/ha of liquid formulations containing 500 g/L or 2.5 to 3.35 kg/ha of wettable powder formulations containing 90 percent atrazine with 17 L/ha oil in 200 to 300 L/ha water or 2.8 L/ha oil concentrate in 150 L/ha water. See Table 9 for product volumes of other Aatrex or Atrazine formulations. Apply when foxtail is in the one to two leaf stage. Foxtail control has not always been consistent. Do not add other herbicides such as 2,4-D to combinations of oil-water emulsions and Aatrex or Atrazine. These products may leave a residue in the soil. See caution note at the beginning of the corn section.

Aatrex-Plus (400 g/L), Atra-Mix (400 g/L) Controls wild oats, seedling green and yellow foxtail, and several broadleaf weeds. (Table 3) Apply 4.25 to 8.5 L/ha in 200 to 300 L water when foxtail is in the one to two leaf stage. Foxtail control has not always been consistent. Do not add other herbicides such as 2,4-D. Aatrex-Plus and Atra-Mix contain oil concentrate. Additional oil or oil concentrate should not be added. These products may leave a residue in the soil. See caution note at the beginning of the corn section.

Atrazine see Aatrex

Basagran (480 g/L) Controls several broadleaf weeds. (Table 3) Apply 1.75 to 2.25 L/ha in 200 to 400 L water. Use the lower rate to control lady's thumb and annual smartweed species 2.5 to 7.5 cm high, wild mustard 2.5 to 12.5 cm high, or cocklebur 7.5 to 17.5 cm high. Use the higher rate to control lady's thumb and annual smartweed species 7.5 to 20 cm high, wild mustard 12.5 to 25 cm high, cocklebur 17.5 to 30 cm high, and seedlings of other susceptible weeds. To control top growth of Canada thistle (patch treatments) apply 1.75 L/ha plus 1.75 L/ha seven to ten days later. Apply in 200 to 400 L/ha of water when thistles are 15 to 20 cm tall. The addition of Citowett Plus at 2.5 L/1000 L or Assist Oil Concentrate at 5 to 10 L/1000 L spray mixture will improve the control of advanced weeds. Best results are obtained when Basagran is applied under high temperature conditions (21°C).

Banvel (400 g/L) Controls several broadleaf weeds. (Table 3) Apply 700 mL/ha in 110 to 220 L water at 300 kPa pressure. Apply up to the 30 cm height of corn (leaf outstretched). When corn is higher than 30 cm drop-nozzles must be used to direct spray to plant base.

Do not graze cattle or harvest for silage until seven days following Banvel application. Do not apply within 12 weeks of harvest. Apply no later than two weeks prior to tassle emergence and before corn is over 75 cm tall.

Banvel (400 g/L) plus 2,4-D amine Controls several broadleaf weeds. (Table 3) Apply 350 mL/ha Banvel plus 850 mL/ha of formulations containing 500 g/L 2,4-D in 110 to 220 L/ha water at 300 kPa pressure. For product volumes of other 2,4-D formulations see Table 10. Apply up to the 15 cm height of corn (leaf outstretched). When corn is higher than 15 cm drop-nozzles must be used to direct spray to plant base.

Do not graze cattle or harvest for silage until seven days following Banvel application. Do not apply within 12 weeks of harvest. Apply no later than two weeks prior to tassle emergence and before corn is over 75 cm tall.

Bladex 80 W (80%) Controls several grasses and broadleaf weeds. See Table 3. Apply Bladex 80 W at 2.75 kg/ha plus Bio-Veg at 1.5 to 2.0 L in 150 to 200 L water. Apply when annual grasses are in the one to two leaf stage and broadleaf weeds are 2.5 to 5.0 cm in height. Do not apply after the three leaf stage of the corn or when corn is under stress due to prolonged cold wet growing conditions. Do not use any oils or adjuvants other than Bio-Veg with Bladex. Do not tank mix with other pesticides.

Bladex may leave a residue in the soil. See the caution note at the beginning of the corn section.

Buctril M (450 g/L) Controls several broadleaf weeds (Table 3). Apply 1.25 L/ha in 200 to 300 L water at a pressure of 275 kPa when corn is in the four to six leaf stage and weed seedlings are small. Leaf scorch may occur if application is made under hot, humid conditions.

Laddok (400 g/L) Controls several broadleaf weeds. See Table 3. Apply 3 to 4 L/ha in 200 to 400 L water at a minimum of 275 kPa pressure. Do not use floodjet type nozzles. Use the 3 L/ha rate for control of annual smartweed species (lady's thumb) 2.5 to 7.5 cm high, wild mustard 2.5 to 12.5 cm high, cocklebur 7.5 to 17.5 cm high and flower-of-an-hour 2.5 to 5 cm high. Use the 4 L/ha rate for control of annual smartweed species (lady's thumb) 7.5 to 20 cm high, wild mustard 12.5 to 25 cm high, cocklebur 17.5 to 30 cm high, flower-of-an-hour 5 to 10 cm high and seedlings of other susceptible weeds. This treatment will not control green foxtail. All applications should include Assist Oil Concentrate at 1 L/100 L of spray solution. Laddock contains atrazine. Plant only corn, flax, peas or fababeans the year following Laddok application. Do not apply if rain is expected within eight hours of application.

Kil-mor (500 g/L) Controls several broadleaf weeds. (Table 3) Apply 0.85 to 1.1 L/ha in a minimum of 100 L water. Apply as an overall spray until corn is 15 cm tall (leaf outstretched), after which a directed spray should be used. See directed postemergence recommendations in this section. Do not apply if rain is expected within six hours.

Pardner (225 g/L) Controls several broadleaf weeds. (Table 3) Apply 1.25 to 1.5 L/ha in at least 200 L water. Apply when corn is in the four to eight leaf stage and before the weeds are past the four leaf stage. Do not apply under conditions of high humidity and high temperature (greater than 30°C) or crop injury may occur.

Torch (227 g/L), Torch DS (450 g/L) Controls several broadleaf weeds. (Table 3) Apply 1.5 to 1.75 L/ha of Torch or 750 to 875 mL/ha of Torch DS in at least 150 L/ha water. Apply before weeds are past the four leaf stage and before corn is 25 cm tall. Do not apply under conditions of high humidity and high temperature (greater that 30°C) or crop injury may occur.

2,4-D Amine Controls several broadleaf weeds. (Table 3) Apply 1.5 to 1.7 L/ha of formulations containing 500 g/L 2,4-D in 100 L water as an overall spray until corn is 15 cm tall (leaf outstretched), after which a directed spray should be used. See directed postemergence recommendations in this section. For product volumes of other 2,4-D amine formulations refer to Table 10.

Directed postemergence

For corn over 15 cm tall (leaf outstretched). Application of these herbicides requires positioning the sprayer nozzles to direct the spray to the base of the corn plant. Severe damage is likely if the crop leaves are sprayed.

Banvel (400 g/L) Controls several broadleaf weeds. (Table 3) Apply 700 mL/ha in 110 to 220 L water at 300 kPa pressure. Direct spray to base of plant after corn is more than 30 cm tall (leaf outstretched).

Do not graze cattle or harvest for silage until seven days following Banvel application. Do not apply within 12 weeks of harvest. Apply no later than two weeks prior to tassle emergence and before corn is over 75 cm tall.

Banvel (400 g/L) plus 2,4-D amine Controls several broadleaf weeds. (Table 3) Apply 350 mL/ha Banvel plus 850 mL/ha of formulations containing 500 g/L 2,4-D in 110 to 220 L/ha water at 300 kPa pressure. Direct spray to base of plant after corn is more than 15 cm tall (leaf outstretched). For product volumes of other 2,4-D formulations see Table 10.

Do not graze cattle or harvest for silage until seven days following Banvel application. Do not apply within 12 weeks of harvest. Apply no later than two weeks prior to tassle emergence and before corn is over 75 cm tall.

Kil-mor (500 g/L) Controls several broadleaf weeds. (Table 3) Apply 1.1 L/ha in 100 to 200 L water. Direct spray to plant base after corn is more than 15 cm tall (leaf outstretched).

2,4-D amine Controls several broadleaf weeds. (Table 3) Apply 1.7 L/ha of formulations containing 500 g/L 2,4-D in 100 to 200 L water. Treat by directing spray to base of plant after corn is more than 15 cm tall (leaf outstretched). For product volumes of other 2,4-D amine formulations see Table 10.

Crambe

Preplant incorporated

Treflan EC (545 g/L) (Spring application only) Controls wild oats, green and yellow foxtail and several broadleaf weeds. See *Field Crops Chart.* Apply 1.5 to 2.6 L/ha in a minimum of 100 L water. Incorporate according to instructions in *Herbicide Information* section. Treflan leaves a residue in the soil which may affect subsequent crops. Refer to *Herbicide Information* section for information on susceptible crops.

Fababeans

Preplant incorporated

Treflan EC (545 g/L) Controls wild oats, green and yellow foxtail and several broadleaf weeds. See *Field Crops Chart.*

Spring application

Apply 1.5 to 2.6 L/ha as a preplant application in at least 100 L water. Incorporate according to instructions in *Herbicide Information* section.

Fall application

Apply 2.0 to 3.0 L/ha in at least 100 L water. Apply between September 1 and freeze-up. Incorporate following instructions in *Herbicide Information* section.

Treflan leaves a residue in the soil which may affect subsequent crops. Refer to *Herbicide Information* section for a list of susceptible crops.

Treflan EC (545 g/L) plus Lexone DF (75%), Lexone L (480 g/L), Sencor DF (75%) or Sencor 500 F (500 g/L) Controls Treflan susceptible weeds plus several other broadleaf weeds. See *Field Crops Chart.* Apply Lexone and Sencor only as a tank mix with Treflan.

Spring application

Apply 1.5 to 2.6 L/ha Treflan plus 350 to 550 g/ha Lexone DF or 550 to 850 mL/ha Lexone L or 375 to 550 g/ha Sencor DF or 500 to 850 mL/ha Sencor 500 as a preplant application in 100 L water. Incorporate as soon as possible according to instructions in *Herbicide Information* section.

Fall application

Apply 2.0 to 3.0 L/ha Treflan plus 400 to 550 g/ha Lexone DF or 625 to 850 mL/ha Lexone L or 550 g/ha Sencor DF or 850 mL/ha Sencor 500 L in 100 L water. Incorporate as soon as possible according to instructions in *Herbicide Information* section.

Both Treflan and Sencor leave residues in the soil which may affect subsequent crops. After harvest, tillage practices that provide soil mixing may be helpful in reducing the chance of injury to subsequent crops. Refer to the *Herbicide Information* section for a list of susceptible crops.

Postemergence

Basagran (480 g/L) Controls several broadleaf weeds. See *Field Crops Chart*. Apply 1.75 to 2.25 L/ha in 200 to 400 L water, after the fababeans are at least 10 cm in height. Use the lower rate to control lady's thumb and annual smartweed species 2.5 to 7.5 cm high, wild mustard 2.5 to 12.5 cm high, or cocklebur 7.5 to 17.5 cm high. Use the higher rate to control lady's thumb and annual smartweed species 7.5 to 20 cm high, wild mustard 12.5 to 25 cm high, cocklebur 17.5 to 30 cm high, and seedlings of other susceptible weeds. The addition of Assist Oil Concentrate at 5 to 10 L/1000 L spray mixture will improve the control of advanced weeds. For best results apply Basagran under higher temperature conditions (21°C).

Hoe-Grass (190 g/L) Controls wild oats, green and yellow foxtail, barnyard grass. Apply 3.75 L/ha in 110 L water with a nozzle pressure of 275 kPa. Direct nozzles 45° forward. Apply at one to four leaf stage of the weeds, before they tiller. See *Herbicide Information* section for application instructions. Do not apply Hoe-Grass if rain is expected within one hour.

Premerge 360 (360 g/L), Sinox PE (360 g/L), Yellow Stuff PE (360 g/L) Controls wild mustard, stinkweed, and volunteer rapeseed. Apply 2.75 to 4.25 L/ha in 100 to 200 L water. Use when weeds are in the seedling stage and fababeans are in the two to four leaf stage. These products control weeds by contact action only. For satisfactory weed control ensure that the field sprayer provides total coverage of all weeds.

CAUTION: *Use rubber gloves, goggles and agricultural respirator when handling Premerge 360, Sinox PE or Yellow Stuff PE.*

Sinox PE see Premerge 360

Yellow Stuff PE see Premerge 360

TABLE 4. SUMMARY OF FLAX RECOMMENDATIONS

NOTE: See Table 15 for complete weed spectrum.

HERBICIDE	Barnyard grass	Foxtail, green & yellow	Wild oats	Buckwheat, wild	Catchfly, night flowering	Chickweed	Cleavers	Cow cockle	Cocklebur	Flixweed	Hemp nettle	Kochia	Lamb's quarters	Mustard, wild	Pigweed, red root	Russian thistle	Shepherd's purse	Smartweed, annual species	Stinkweed	Thistle, sow (perennial)	Thistle, Canada
Asulox F	S	S	●	S										S				S	S		
Asulox F + Buctril M	S	S	●	●				●	●	●		●	●	●	●	●	●	●	●	□[c]	□[c]
Avadex BW			●																		
Basagran						●			●				●	●	●		●	●	●		□[b]
Basfapon/Dalapon/ Dowpon/Dowpon M		●																			
Basfapon/Dalapon Dowpon/Dowpon M + MCPA		●							●	●			★	★			★		★		
Blagal				●		●				●	●		●	●	●		●	●	●	□	□
Brominal M/Bromox 450 M/ Buctril M/Sabre				●				●	●	●		●	●	●	●	●	●	●	●	□[c]	□[c]
Eptam	●	●	●			●							●		●						
Hoe-Grass	●	●	●																		
Hoe-Grass + Torch/Torch DS	●	●	●	●				●	●			●	●	●	●	●		●	●		
Hoe-Grass II	●	●	●	●				●	O			O	●	●	●	●		●	●		
MCPA/MCPAK									●	●	●[a]		★	★			★		★	□	□
NaTA TCA/TCA Solution		●																			
NaTA TCA/TCA Solution + MCPA		●							●	●			★	★			★		★	□	□
Poast	★	★	★																		
Poast + Brominal M/ Bromox 450 M/Buctril M	★	★	★	●				●	●	●		●	●	●	●	●	●	●	●	□[c]	□[c]
Poast + MCPA	★	★	★						●	●			★	★			★		★	□	□
Stampede 360 + MCPA ester		●		●						●		●	●	●	●		●	●	●		
Stampede CM		●		●						●		●	●	●	●		●	●	●		
Torch/Torch DS				●				●	●			●	●	●	●	●		●	●		
Treflan	●	●	●	●		●		●				O	●		●	●					

LEGEND

- ● Controlled by maximum rates recommended. Where two brand names are recommended, the weed may not appear on both labels.
- ★ Controlled by rates less than the maximum recommended for flax.
- O Not labelled for control but adequate control can be expected.
- □ Top growth only.
- S Suppression.
- [a] MCPAK only.
- [b] Split applications required for adequate control.
- [c] Regrowth can be expected.

Preplant incorporated

Avadex BW (400 g/L), Avadex BW Granular (10%) **Controls wild oats. Apply 4.25 to 5.5 L/ha or 17.5 to 22.5 kg/ha granular product in the fall or before seeding in the spring. The granular formulation is more suited to fall application while the liquid is better for spring applications. Apply the liquid product in 100 L/ha water. Use a suitable granular applicator to apply the granular product.**

Avadex BW liquid may be applied with liquid fertilizer, or on granular urea fertilizer. See the *Herbicide Information* section for specific instructions regarding application and use on dry urea fertilizer, as well as application and incorporation instructions for all formulations of Avadex BW. For aerial recommendations for granular Avadex BW see Table 8. Do not seed domestic oats the year after treatment with Avadex BW.

Eptam 8-E (800 g/L), Eptam 10 G (10%) Controls barnyard grass, green and yellow foxtail, wild oats and several broadleaf weeds. See *Table 4 and Field Crops Chart.*

Spring application

Apply 3.5 to 4.25 L/ha or 28 to 34 kg/ha granular product. Mix liquid in a minimum of 100 L/ha water. The granular product should be applied with a suitable granular applicator. Eptam must be applied to a dry soil surface of a well-prepared seedbed. Incorporate immediately according to instructions in *Herbicide Information* section. Do not use on soils with less than three percent organic matter. Seed shallowly, no deeper than 3 cm, into a firm seedbed. Do not discer seed.

Fall application

Apply at 4.25 to 5.5 L/ha or 34 to 45 kg/ha granular product. Apply liquid in at least 100 L/ha water. Apply in late fall just before freeze-up to a dry soil surface of a well-prepared seedbed. Incorporate immediately following instructions in Herbicide Information section. Seed shallow into a firm seedbed. Do not discer seed. If necessary, follow Eptam application with a recommended herbicide to control broadleaf weeds.

Eptam 8-E may be applied with liquid fertilizer, or on granular fertilizer. See the *Herbicide Information* section for specific instructions regarding application and use on dry fertilizer.

Treflan EC (545 g/L), Treflan Qlt 5 (5%) Controls wild oats, green and yellow foxtail and several broadleaf weeds. See *Table 4 and Field Crops Chart.* Apply only in the fall, at 2.0 to 3.0 L/ha or 28 to 34 kg/ha granular product. The liquid product should be applied in at least 100 L/ha water, and the granular product with a suitable granular applicator. Apply between September 1 and freeze-up. Incorporate as soon as possible according to instructions in the *Herbicide Information* section but observe these precautions:

- Both incorporations must be done in the fall.
- The seedbed should be shallowly tilled in the spring.
- Seed into a moist seedbed no more than 4.0 cm deep, using only a press drill or hoe drill.
- Do not seed in early May when soil conditions are cold and not conducive to rapid emergence.

Generally seeding should not start prior to May 15.

The liquid or granular product can be applied in summer on summerfallow at the higher rates of 3.0 L/ha liquid or 34 kg/ha granular product. Apply and incorporate between June 1 and September 1. The second incorporation may be anytime up to soil freeze-up. Treflan leaves a residue in the soil which may affect subsequent crops. See the *Herbicide Information* section for a list of susceptible crops.

Postemergence

Asulox F (400 g/L) Controls wild oats, green and yellow foxtail (suppression only), barnyard grass and several broadleaf weeds. See *Table 4 and Field Crops Chart.* Apply 2.75 L/ha in 50 to 100 L water when wild oats are in the two to four leaf stage and flax plants are 2.5 to 15 cm high.

Time the application for best control of wild oats. The addition of Buctril M as a tank mix at the rate of 0.93 L/ha improves the control of broadleaf weeds and also controls lamb's-quarters and shepherd's purse. Follow mixing instruction on label. Crop recovery may be slow if weeds have been allowed to smother the flax prior to spraying.

CAUTION: *Do not apply during hot humid weather or when flax is under stress.*

Basagran (480 g/L) Controls several broadleaf weeds. See *Table 4 and Field Crops Chart.* Apply 1.75 to 2.25 L/ha in 200 to 400 L water when flax is at least 5 cm tall. Use the higher rate on red root pigweed taller than 3.75 cm, when lady's thumb and annual smartweed species are more than 7.5 cm and cocklebur taller than 17.5 cm. The addition of Assist Oil Concentrate at 5 to 10 L/1000 L spray mixture will improve the control of advanced weeds. For best results use Basagran under high temperature conditions (21°C).

Basfapon (74%), Dalapon (74%), Dowpon (74%) Dowpon M (74%) Controls green and yellow foxtail. Apply 1.1 to 1.75 kg/ha product in a minimum of 100 L water when grasses are in the one to three leaf stage and the flax is 10 to 15 cm tall. Avoid overlapping. MCPA amine can be tank mixed when broadleaved weeds are present.

Blagal (375 g/L) Controls several broadleaf weeds. See *Table 4 and Field Crops Chart.* Apply 2.25 L/ha in 100 L water at a minimum of 275 kPa pressure. Blagal should be applied to actively growing weeds in the two to five leaf stage and when the crop is 5 to 10 cm tall. Do not spray flax during hot, humid weather conditions. If the crop is under stress (lack of moisture or extremes in temperature) a temporary yellowing of the crop may occur. Flax will recover with no adverse effects on yields. See *Herbicide Information* section for additional application instructions.

Brominal M (450 g/L), Bromox 450 M (450 g/L), Buctril M (450 g/L), Sabre (720 g/L) Controls several broadleaf weeds. See *Table 4 and Field Crops Chart.* Apply Brominal M, Bromox 450 M or Buctril M at 1.25 L/ha or Sabre at 780 mL/ha in 100 L water when flax is 5 to 10 cm tall and weeds are small. There may be some leaf burn and a delay in maturity of two to three days. Do not spray in hot, humid weather conditions. These treatments will give some top growth control of Canada thistle and perennial sow-thistle but regrowth can be expected.

Bromox 450 M see Brominal M

Buctril M see Brominal M

Dalapon see Basfapon

Dowpon, Dowpon M see Basfapon

Hoe-Grass (190 g/L) Controls wild oats, green and yellow foxtail and barnyard grass. Apply 3.75 L/ha in

at least 110 L water with nozzles directed 45° forward. Apply at one to four leaf stage of the weeds, before they tiller. Hoe-Grass may be tank mixed with 1.25 L/ha of Pardner or Torch or 625 mL/ha of Torch DS to control weeds susceptible to those chemicals. Wild mustard beyond the three leaf stage will not be controlled. If a wide range of leaf stages is present at the time of spraying a split application involving Hoe-Grass and another broadleaf herbicide is recommended to obtain adequate control of wild mustard. Other herbicides for broadleaf weed control must be applied at least four days after Hoe-Grass application. Do not use Hoe-Grass if rain is expected within one hour. See the *Herbicide Information* section for application instructions. For aerial recommendations see Table 8.

Hoe-Grass II (310 g/L) Controls wild oats, green and yellow foxtail, barnyard grass and several broadleaf weeds. See *Table 4* and *Field Crops Chart.* Apply 3.5 L/ha in not less than 110 L water with nozzles directed 45° forward, and at a minimum nozzle pressure of 275 kPa. Use of 80° flat fan nozzles is recommended. Apply when wild oats, green and yellow foxtail, and barnyard grass are in the one to four leaf stage and before tillering, when volunteer corn is 15 to 25 cm in height, when Russian thistle is up to 5 cm in height, and when other broadleaf weeds are up to the four leaf stage. Wild mustard beyond the three leaf stage will not be controlled. If a wide range of leaf stages is present at the time of spraying a split application involving Hoe-Grass and another broadleaf herbicide is recommended to obtain adequate control of wild mustard. Apply when flax is 5 to 10 cm in height. Do not apply to flax under stress due to hot (28° C) or humid weather. Do not tank mix with any other pesticide, fertilizer or additive. Do not use floodjet type nozzles or controlled droplet applicators. Do not apply if rainfall is expected within one hour after application.

MCPA amine, sodium potassium salt mixtures or sodium salt. Controls several broadleaf weeds. See *Table 4 and Field Crops Chart.* Apply 1.25 to 1.7 L/ha of formulations containing 500 g/L MCPA in 100 L water when flax is 5 cm tall until just before the bud stage. For product volumes of other MCPA formulations refer to Table 10. Some delay in maturity and crop injury may result from use of the higher rates, but will most often be more than offset by increased yields, if the infestation of susceptible weeds is moderate to high. Should only wild mustard, lamb's-quarter, and spring seedlings of stinkweed or flixweed be present, the rate of MCPA can be reduced to 840 mL/ha of formulations containing 500 g/L MCPA. For aerial recommendations see Table 8.

MCPAK (400 g/L) Controls hemp nettle and other MCPA susceptible weeds. See *Table 4 and Field Crops Chart.* Apply 2.1 L/ha in 100 L/ha water when weeds are in the one to four leaf stage. Hemp nettle must be treated before the full four leaf stage. Some delay in maturity and crop injury may result.

NaTA TCA (85%), TCA Solution (568 g/L) Controls green and yellow foxtail. Apply 5.5 to 9 L/ha of TCA Solution or 4.48 kg/ha product NaTA TCA in 100 to 150 L water. Apply before the foxtail reaches the three leaf stage, when flax is 10 to 15 cm tall and avoid overlapping. When broadleaf weeds are present tank mixes of NaTA TCA with MPCA amine or TCA solution with MPCA ester may be used.

Poast (184 g/L) Controls several grassy weeds. See *Table 4* and *Field Crops Chart.* Apply 0.8 to 1.0 L/ha for control of green and yellow foxtail, barnyard grass, proso millet, witchgrass, and volunteer corn; 1.4 to 1.6 L/ha for control of wild oats; 1.6 L/ha for control of volunteer wheat and volunteer oats; or 1.9 L/ha for control of volunteer barley. Where a rate range is specified for a weed, use the higher rate to control heavy infestations. Apply in 50 to 250 L/ha water at a minimum pressure of 240 kPa. Include Assist Oil Concentrate at 0.75 to 2.0 L/ha. Use the higher rate when applying the higher recommended spray volumes. Apply when weeds are in the one to six leaf stage with the majority in the two to five leaf stage. Control may be reduced if grasses are not actively growing due to drought, flooding, or prolonged cool temperatures (15° C or less). Do not apply using floodjet or hollow cone nozzles. For aerial recommendations see Table 8.

Poast may be tank mixed with Brominal M, Bromox 450 M, Buctril M, MCPA ester or MCPA amine. If weeds are not actively growing at the time of application, these mixtures may reduce grassy weed control. Reductions will be greater with amine than with ester formulations of MCPA and will be most evident at the lower rates of Poast application. These tank mixtures may also cause temporary crop injury and delay maturity. Refer to recommendations for the broadleaf herbicide for timing, rates and use precautions. Allow a four day interval between application of Poast and any other herbicides.

Sabre see Brominal M

Stampede 360 (360 g/L) plus MCPA ester Controls green and yellow foxtail and several broadleaf weeds. See *Table 4 and Field Crops Chart.* Apply 2.75 L/ha Stampede 360 in a tank mix with 550 mL of ester formulations containing 500 g/L MCPA in 100 L/ha water when weeds are in the one to four leaf stage and the majority of the foxtail in the three leaf stage and less than 2.5 cm tall. Flax at application time must be at least 5 cm but not more than 12 cm in height. Do not spray when temperature exceeds 30°C. For product volumes of other MCPA ester formulations see Table 10.

CAUTION: *Under stress conditions, expect some suppression of flax growth immediately after treatment and some delay in maturity. Specific application instructions are given in the Herbicide Information* section.

Stampede 360 is also registered for application without MCPA. The spectrum of broadleaved weeds controlled and effectiveness of green foxtail control will be reduced.

Stampede CM (460 g/L) Controls green and yellow foxtail and several broadleaf weeds. See *Table 4 and*

Field Crops Chart. Apply 2.75 L/ha in 100 L water when weeds are in one to four leaf stage and the majority of the foxtail is in the three leaf stage and less than 2.5 cm tall. Flax at application time must be at least 5 cm but not more than 12 cm in height. Do not spray when temperatures exceed 30°C.

CAUTION: *Under stress conditions, suppression of flax growth immediately after treatment and some delay in maturity can be expected. Specific application instructions are given in the Herbicide Information section.*

TCA Solution see NaTA TCA

Torch (227 g/L), Torch DS (450 g/L) Control several broadleaf weeds. See *Table 4 and Field Crops Chart.* Apply 1.25 L/ha of Torch or 625 mL/ha of Torch DS in 100 L water when flax is 5 to 10 cm tall, when Russian thistle is up to 5 cm in height, and when other broadleaf weeds are up to the four leaf stage. Wild mustard beyond the three leaf stage will not be controlled. If a wide range of leaf stages are present at the time of spraying, tank mixing with MCPA is recommended to obtain adequate control of wild mustard.

Do not spray flax during hot humid weather conditions. Torch and Torch DS may be tank mixed with MCPA amine at 560 mL/ha of formulations containing 500 g/L MCPA, or with MCPAK at 0.7 L/ha to improve control of more advanced weeds. For product volumes of other MCPA amine formulations, refer to Table 10.

For flax underseeded to forages see the *Forage Crops* section.

Lentils

Preplant incorporated

Treflan EC (545 g/L), Treflan QR 5 (5%) Controls wild oats, green and yellow foxtail, and several broadleaf weeds. See *Field Crops Chart.* Apply only in the fall, at 2.0 to 3.0 L/ha in at least 100 L water, or 22 to 34 kg/ha granular product between September 1 and freeze-up. Granular product should be applied with a suitable granular applicator. Incorporate as soon as possible according to instructions in the *Herbicide Information* section but observe these precautions.

- Both incorporations must be done in the fall.
- The seedbed should be shallowly tilled and packed just prior to seeding in the spring.
- Seed into a moist seedbed no more than 4.0 cm deep, using only a press drill or hoe drill.

Postemergence

Hoe-Grass (190 g/L) Controls wild oats, green and yellow foxtail and barnyard grass. Apply 3.75 L/ha in at least 110 L water with nozzles directed 45° forward. Apply at one to four leaf stage and before tillering of the weeds. Other herbicides for broadleaf weed control must be applied at least four days after Hoe-Grass application. Do not apply if rain is expected within one hour. Refer to *Herbicide Information* section for application instructions.

Lexone DF (75%), Lexone L (480 g/L), Sencor 500 L (500 g/L), Sencor DF (75%) Suppression of several broadleaf weeds. See *Field Crops Chart.* Apply 425 mL/ha Sencor 500, 440 mL/ha Lexone, 275 g/ha Sencor DF or 280 g/ha Lexone DF in at least 170 L water to seedling weeds less than 5 cm in height or diameter when lentil vines are 7.5 to 15 cm long. Directing the nozzles 45° forward may improve spray coverage. Do not apply within 3 days after periods of cool, wet, or cloudy weather as crop injury may occur. Do not apply more than once per crop season. Crop must be planted at least 5 cm below the soil surface. Do not use on soils containing less than four per cent organic matter. Avoid grazing or feeding treated crop to livestock within 70 days of application. Do not apply if rain is expected within six hours. Temporary (one to ten days) lightening in crop color and a slight reduction in crop height may be observed, especially if frost or abnormally high temperatures occur within one or two days after application. Do not apply for four to five days after frost and allow a four to five day interval between application of Sencor or Lexone and other pesticides. Lentils provide little competition against weed growth. Under conditions of heavy weed pressure or lush weed growth, this treatment may not provide adequate control due to regrowth of some weeds.

Mustard

Preplant incorporated

Avadex BW (400 g/L), Avadex BW Granular (10%) Controls wild oats. Apply 4.25 to 5.5 L/ha or 17.5 to 22.5 kg/ha granular product in the fall or before seeding in the spring. The granular formulation is more suited to fall applications, the liquid to spring applications. Apply liquid product in 100 L/ha water. The granular product should be applied with a suitable granular applicator.

Avadex BW liquid may be applied with liquid fertilizer or on granular urea fertilizer. Refer to the *Herbicide Information* section for specific instructions regarding application and use on dry urea fertilizer, as well as application and incorporation instructions for all formulations of Avadex BW. Do not seed domestic oats the year after treatment with Avadex BW. For aerial recommendations see Table 8.

Treflan EC (545 g/L), Treflan QR5 (5%) Controls wild oats, green and yellow foxtail and several broadleaf weeds. See *Field Crops Chart.* Apply 1.5 to 2.6 L/ha in at least 100 L/ha water, or 17 to 28 kg/ha granular product as a preplant application. Granular product should be applied with a suitable granular applicator and incorporated according to instructions in the *Herbicide Information* section.

Fall application

Apply 2.0 to 3.0 L/ha or 22 to 34 kg/ha granular product. Apply liquid product in at least 100 L/ha water between September 1 and freeze-up. Granular product should be applied with a suitable granular applicator. Treflan leaves a residue in the soil which may affect subsequent crops. See *Herbicide Information* section for a list of susceptible crops.

Postemergence

Hoe-Grass (190 g/L) Controls wild oats, green and yellow foxtail and barnyard grass. Apply at 3.75 L/ha in at least 110 L water with nozzles directed forward 45°. Apply at the one to four leaf stage and before tillering of weeds. Application instructions are in the *Herbicide Information* section. Do not apply Hoe-Grass if rain is expected within one hour.

Peas

(Field and Processing)

Preplant incorporated

Avadex BW (400 g/L) Controls wild oats. Apply 4.25 L/ha in 100 L water before seeding. For spring or fall application on field peas only. Avadex BW liquid may be applied with liquid fertilizer or on granular urea fertilizer. Refer to *Herbicide Information* section for application and incorporation instructions. Do not seed domestic oats the year after treatment with Avadex BW.

Treflan (545 g/L), Treflan QR5 (5%) Controls wild oats, green and yellow foxtail and several broadleaf weeds. See *Field Crops Chart.*

Spring application

Apply 1.5 to 2.6 L/ha as a preplant application in at least 100 L water, or 17 to 28 kg/ha granular product. Granular product should be applied with a suitable granular applicator and incorporated according to instructions in *Herbicide Information* section.

Fall application

Apply 2.0 to 3.0 L/ha in at least 100 L water, or 22 to 34 kg/ha granular product. Apply between September 1 and freeze-up. Apply granular product using a suitable granular applicator. Follow instructions for incorporation in the *Herbicide Information* section. Treflan leaves a residue in the soil which may affect subsequent crops. Refer to *Herbicide Information* section for a list of susceptible crops.

Postemergence

Basagran (480 g/L) Controls several broadleaf weeds. See *Field Crops Chart.* Apply 1.75 to 2.25 L/ha in 200 to 400 L water after peas have three pairs of leaves. Use the lower rate to control lady's thumb and annual smartweed species 2.5 to 7.5 cm high, wild mustard 2.5 to 12.5 cm high, or cocklebur 7.5 to 17.5 cm high. Use the higher rate to control lady's thumb and annual smartweed species 7.5 to 20 cm high, wild mustard 12.5 to 25 cm high, cocklebur 17.5 to 30 cm high, and seedlings of other susceptible weeds. The addition of Citowett Plus at 2.5 L per 1000 L spray mixture will improve the control of advanced weeds. Basagran gives best results when applied under higher temperature conditions (21°C). Avoid spraying process peas with a ground sprayer after the vines are more than 15 cm in length to minimize mechanical damage to the vines.

Basfapon (74%), Dalapon (74%), Dowpon (74%), Dowpon M (74%). Controls green and yellow foxtail. Apply 1.1 kg/ha product in a minimum of 275 L water when peas are 5 to 15 cm high. Apply at least 25 days prior to harvest. Do not feed pea vines, pea silage or pea vine hay to livestock.

Basfapon may be tank mixed with MCPA, Tropotox Plus, Premerge 360, or Sinox PE.

Dalapon may be tank mixed with Premerge 360 or Sinox PE.

Dowpon may be tank mixed with Premerge 360.

Hoe-Grass (190 g/L) Controls wild oats, green and yellow foxtail and barnyard grass. Apply 3.75 L/ha in at least 110 L water with nozzles directed forward 45°. Apply at one to four leaf stage of the weeds, before they tiller. Other herbicides for broadleaf weed control must be applied at least four days after Hoe-Grass application. Do not apply if rain is expected within one hour. Refer to the *Herbicide Information* section for application instructions.

MCPA Sodium Salt (300 g/L) Controls several broadleaf weeds. See *Field Crops Chart.* Apply 1.5 L/ha in 150 to 200 L water when vines are 10 to 18 cm long. MCPA sodium salt may be mixed with Dalapon or TCA.

NaTA TCA (85%), TCA Solution (568 g/L) Controls green and yellow foxtail. Apply 4.5 kg/ha product NaTA TCA or 5.5 to 9 L/ha of TCA Solution in 100 L water, to field peas only. Use when pea vines are 10 to 20 cm long and when foxtail is in the one to three leaf stage. NaTA TCA and TCA Solution may be tank mixed with MCPA when broadleaf weeds are present.

Premerge 360 (360 g/L), Sinox PE (360 g/L) Controls several broadleaf weeds. See *Field Crops Chart.* Apply 3 to 4 L/ha in a minimum of 100 L water postemergence when vines are 10 to 20 cm long and weeds are small. Premerge 360 or Sinox PE may be tank mixed with Dalapon for green foxtail control.

Premerge 360 and Sinox PE control weeds by contact action only. It is important to ensure that the field sprayer provides total coverage of all weeds to obtain satisfactory weed control.

CAUTION: *Use rubber gloves, goggles, and agricultural respirator when handling Premerge 360 or Sinox PE.*

Sencor 500 F (500 g/L), Sencor 75 DF (75%) Controls several broadleaf weeds. See *Field Crops Chart.* Apply 425 to 550 mL/ha Sencor 500 F or 280 to 375 g/

ha Sencor 75 DF in at least 170 L water to seedling weeds less than 5 cm in height or diameter. Apply before pea vines are 15 cm long. Directing nozzles 45° forward may improve spray coverage. Do not apply within three days after periods of cool, wet, or cloudy weather as crop injury may occur. Do not apply for five days after a frost. Temporary lightening in crop colour and a slight reduction in crop height may be observed, especially if frost or abnormally high temperatures occur within one or two days after application. Do not apply if rain is expected within six hours. Do not tank mix with other pesticides, wetting agents, or surfactants. Allow a five day interval between application of Sencor and other pesticides. Apply Sencor only once per season. Use only if crop is planted at least 5 cm below the soil surface. Do not use on soils with less than four percent organic matter. Under conditions of heavy weed pressure or lush growth, this treatment may not provide adequate control due to regrowth of some weeds.

Sinox PE see Premerge 360

Tropotox Plus (400 g/L) Controls several broadleaf weeds. See *Field Crops Chart.* Apply 2.75 to 4.25 L/ha in 150 to 200 L water, when peas have three to six nodes. This treatment is especially useful in peas for the prevention of Canada thistle head formation.

CAUTION: *For sensitive canning peas, use Tropotox only.*

Yellow Stuff PE (360 g/L) Controls several broadleaf weeds. See *Field Crops Chart.* Apply 2.75 to 4.25 L/ha in 400 to 500 L of water when pea vines are 10 to 15 cm long.

Do not apply after flower buds are visible. Peas must be dry. Application should be made on a sunny day when temperatures are between 18° and 29°C. Use the lower rates when temperature is over 21°C.

CAUTION: *Use rubber gloves, goggles and an agricultural respirator when handling Yellow Stuff PE.*

Rapeseed (including Canola)

TABLE 5. SUMMARY OF RAPESEED RECOMMENDATIONS

NOTE: See Table 15 for complete weed spectrum.

HERBICIDE	Barnyard grass	Foxtail, green & yellow	Wild oats	Buckwheat, wild	Catchfly, night flowering	Chickweed	Cleavers	Cow cockle	Cocklebur	Flixweed	Hemp nettle	Kochia	Lamb's quarters	Mustard, wild	Pigweed, red root	Russian thistle	Shepherd's purse	Smartweed, annual species	Stinkweed	Thistle, sow (perennial)	Thistle, Canada
Avadex BW			●																		
Basfapon/Dalapon/Dowpon		●																			
Benazolin														S							
Hoe-Grass	●	●	●																		
NaTA TCA/TCA Solution		●																			
Poast	*	*	*																		
Treflan	●	●	●	●		●		●				O	●		●	●					

LEGEND

● Controlled by maximum rates recommended.
* Controlled by rates less than the maximum recommended for rapeseed.
O Not labelled for control but adequate control can be expected.
S Suppression.

Perennial sow-thistle and Canada thistle cannot be effectively controlled in rapeseed. Herbicides such as 2,4-D, MCPA or Banvel will cause significant crop injury and yield reduction. Rapeseed should be planted on fields which are free of perennial thistles. If thistle growth develops in rapeseed fields, consider after-harvest spraying and selective control in the following crop.

Preplant incorporated

Avadex BW (400 g/L), Avadex BW Granular (10%)
Controls wild oats. Apply 4.25 to 5.5 L/ha or 17.5 to 22.5 kg/ha granular product in the fall or before seeding in the spring. The granular formulation is more suited to fall applications, and the liquid to spring applications. Liquid product should be applied in 100 L/ha of water. Apply granular product with a suitable granular applicator. Refer to the *Herbicide Information* section for application incorporation instructions.

Avadex BW liquid may be applied with liquid fertilizer, or on granular urea fertilizer. See the *Herbicide Information* section for specific instructions on application and use on dry urea fertilizer, as well as application and incorporation instructions for all formulations of Avadex BW. For aerial recommendations for granular Avadex BW see Table 8. Do not seed domestic oats the year after treatment with Avadex BW.

Treflan EC (545 g/L), Treflan QR 5 (5% granular)
Controls wild oats, green and yellow foxtail and several broadleaf weeds. See *Table 5 and Field Crops Chart.*

Spring application

Apply 1.5 to 2.6 L/ha in 100 L water or 17 to 28 kg/ha granular product. Use a suitable granular applicator and refer to the *Herbicide Information* section for application instructions.

Fall application

Apply 2.0 to 3.0 L/ha in 100 L water or 22 to 34 kg/ha granular product between September 1 and freeze-up. Liquid product should be applied in at least 100 L/ha water. The granular product should be applied with a suitable granular applicator.

Treflan EC or QR 5 can be applied in summerfallow at the higher rate of 3.0 L/ha or 34 kg/ha granular product. Apply and incorporate between June 1 and September 1. The second incorporation may be done anytime up to soil freeze-up. Check application and incorporation instructions in the *Herbicide Information* section. Treflan leaves a residue in the soil which may affect subsequent crops. See *Herbicide Information* section for susceptible crops.

Postemergence

Rapeseed (Canola) is extremely sensitive to broadleaf herbicides such as 2,4-D, MCPA and Banvel. Ensure that sprayers are thoroughly cleaned before using to

apply herbicides to rapeseed (Canola). The Manitoba Agriculture publication *Field Sprayers* contains detailed instructions on cleaning sprayers.

Basfapon (74%), Dalapon (74%), Dowpon M (74%) Controls green and yellow foxtail. Apply 1.1 to 1.75 kg/ha product in a minimum of 100 L water when grasses are in the one to three leaf stage. Basfapon should be applied when rapeseed is in the two to four leaf stage; Dowpon and Dowpon M should be applied when rapeseed is from seedling to 15 cm tall.

Benazolin (330 g/L) Control or suppression of wild mustard. Apply 2.1 L/ha in 55 to 110 L water when rapeseed is in the three to five leaf stage and wild mustard in the two to four leaf stage. Do not apply if rain is expected within four hours.

Carbyne 2 EC (240 g/L) Carbyne is registered for wild oat control in rapeseed. Carbyne must be applied when wild oats are in the one to two leaf stage. Vigorous crop competition is necessary to suppress the remaining wild oats. To improve control with Carbyne apply only at the higher registered rates of 1.5 to 1.75 L/ha.

Dalapon see Basfapon

Dowpon M see Basfapon

Hoe-Grass (190 g/L) Controls wild oats, green and yellow foxtail and barnyard grass. Apply 3.75 L/ha in at least 110 L water with nozzles directed 45° forward when weeds are in the one to four leaf stage, before they tiller. Do not apply Hoe-Grass if rain is expected within one hour. Refer to the *Herbicide Information* section for specific application instructions.

NaTA TCA (85%), TCA Solution (568 g/L) Controls green and yellow foxtail. Apply 4.48 kg/ha product NaTA TCA or 5.5 to 9 L/ha TCA solution in 100 to 150 L water. Apply before the foxtail reaches the three leaf stage, when rapeseed is in the two to four leaf stage. Avoid overlapping and do not tank mix NaTA TCA or TCA Solution when using in rapeseed.

Poast (184 g/L) Controls several grassy weeds. See *Table 5 and Field Crops Chart.* Apply 0.8 to 1.0 L/ha for control of green and yellow foxtail, barnyard grass, proso millet, witchgrass and volunteer corn; 1.4 to 1.6 L/ha for control of wild oats; 1.6 L/ha for control of volunteer wheat and volunteer oats; or 1.9 L/ha for control of volunteer barley. Where a rate range is specified for a weed, use the higher rate to control heavy infestations. Apply in 50 to 250 L/ha water at a minimum pressure of 240 kPa. Include Assist Oil Concentrate at 0.75 to 2.0 L/ha. Use the higher rate when applying the higher recommended spray volumes. Apply when weeds are in the one to six leaf stage with the majority in the two to five leaf stage. Control may be reduced if grasses are not actively growing due to drought, flooding, or prolonged cool temperatures (15° C or less). Do not apply using flood-jet or hollow cone nozzles. For aerial recommendations see Table 8.

Soybeans

Preplant incorporated

Amiben (240 g/L) plus Treflan EC (545 g/L) Controls wild oats, green and yellow foxtail, barnyard grass and several broadleaf weeds. See *Field Crops Chart.* Apply Amiben at 9.25 L/ha only as a tank mix with Treflan at 1.5 to 2.0 L/ha in at least 100 L water. Apply to a dry soil surface in the spring before planting, and incorporate as soon as possible according to instructions for Treflan in the *Herbicide Information* section.

Treflan EC (545 g/L) Controls wild oats, green and yellow foxtail and several broadleaf weeds. See *Field Crops Chart.*

Spring application

Apply 1.5 to 2.6 L/ha as a preplant application in at least 100 L water. Incorporate according to instructions in the *Herbicide Information* section.

Fall application

Apply 2.0 to 3.0 L/ha in at least 100 L water. Apply between September 1 and freeze-up. Incorporate following instructions in the Herbicide Information section. Treflan leaves a residue in the soil which may affect subsequent crops. Refer to the *Herbicide Information* section for a list of susceptible crops.

Postemergence

Basagran (480 g/L) Controls several broadleaf weeds. See *Field Crops Chart.* Apply 1.75 to 2.25 L/ha in 200 to 400 L water. Apply after the first trifoliolate leaf stage. Use the lower rate to control lady's thumb and annual smartweed species 2.5 to 7.5 cm high, wild mustard 2.5 to 12.5 cm high, or cocklebur 7.5 to 17.5 cm high. Use the higher rate to control lady's thumb and annual smartweed species 7.5 to 20 cm high, wild mustard 12.5 to 25 cm high, cocklebur 17.5 to 30 cm high, and seedlings of other susceptible weeds. For top growth control of Canada thistle apply Basagran at 1.75 L/ha when thistles are 15 to 20 cm high followed by a second application of 1.75 L/ha seven to ten days later. The addition of Citowett Plus at 2.5 L/1000 L or Assist Oil Concentrate at 5 to 10 L/1000 L spray mixture improves control of advanced weeds. Best results are obtained when Basagran is applied under high temperature conditions (21°C).

Hoe-Grass (190 g/L) Controls wild oats, green and yellow foxtail, barnyard grass. Apply 5.25 L/ha in 110 L water with a nozzle pressure of 275 kPa. Direct nozzles 45° forward. Apply at one to four leaf stage of the weeds, before they tiller. See the *Herbicide Information* section for application instructions. Do not apply Hoe-Grass if rain is expected within one hour.

Poast (184 g/L) Controls several grassy weeds. See *Field Crops Chart.* Apply 0.8 to 1.0 L/ha for control of green and yellow foxtail, barnyard grass, proso millet,

witchgrass and volunteer corn; 1.4 to 1.6 L/ha for control of wild oats; 1.6 L/ha for control of volunteer wheat and volunteer oats; or 1.9 L/ha for control of volunteer barley. Where a rate range is specified for a weed, use the higher rate to control heavy infestations. Apply in 50 to 250 L/ha water at a minimum pressure of 240 kPa. Include Assist Oil Concentrate at 0.75 to 2.0 L/ha. Use the higher rate when applying the higher recommended spray volumes. Apply when weeds are in the one to six leaf stage with the majority in the two to five leaf stage. Control may be reduced if grasses are not actively growing due to drought, flooding, or prolonged cool temperatures (15° C or less). Do not apply using floodjet or hollow cone nozzles. For aerial recommendations see Table 8.

TABLE 6. HERBICIDES FOR SUGAR BEETS

HERBICIDES \ WEEDS	Barnyard Grass	Cereal Grains	Shepherd's Purse	Purslane	Pigweed, Tumble	Pigweed, Red Root	Pigweed, Prostrate	Nightshade	Mustard, Wild	Lamb's-Quarters	Kochia	Henbit	Chickweed	Buckwheat, Wild	Quack Grass	Wild Oats	Foxtail, Yellow	Foxtail, Green	Annual Smartweed Species, Lady's Thumb	Stinkweed
Avadex BW					●															
Basfapon/Dalapon/Dowpon/Dowpon M			●	●																
Betanal			●	●			●			●	●	●								
Betanex							●				●	●			●					●
Carbyne 2 EC					●															
Eptam	●	●	●	●	●	S		●	●		●		●	●	●	●	●			
Gramoxone	CONTROLS ANNUAL WEED SEEDLINGS AND TOP GROWTH OF PERENNIAL WEEDS																			
Herbicide 273							●												●	
Hoe-Grass	●		●	●	●															
NaTA TCA/TCA Solution			●	●																
Nortron	●	●	●	●	●					●	●				●		●	●	●	
Poast	●	●	●	●	●								●		●		●			
Ro-Neet	●		●	●	●				●		●		●		●					
Roundup[a]	CONTROLS ANNUAL WEED SEEDLINGS AND TOP GROWTH OF PERENNIAL WEEDS																			

LEGEND
[a] apply to emerged weeds before or after planting but before sugar beets emerge
● controlled by rates recommended for use in sugar beets
S suppression only

Sugar beets are grown in Manitoba under contract to Manitoba Sugar Company. Crop production is closely supervised by its agricultural field staff. Consult with company personnel regarding any weed problems.

Herbicides are applied to sugar beets either preplant incorporated, preemergence or postemergence or in combination of the two or all three ways. When one herbicide follows a previously applied treatment or the crop is in a stress condition, the rate of each subsequent treatment should be cautiously applied at the minimum recommended rate to avoid crop injury.

Herbicides requiring deep soil incorporation in spring are used at the risk of losing seedbed moisture for germination of the beet seed. This hazard tends to limit the use of chemicals that need spring incorporation in Manitoba. Fall applied herbicides avoid this problem. Such herbicides may be followed at reduced rates by pre or postemergence herbicides in spring where necessary to control any escaped weeds. However, one is cautioned not to apply postemergence herbicides following preplant sprays until conditions are favourable for their safe use.

All rates given are for an overall application. Chemical use can be reduced to one-third when applying a 17.5 cm band on the row. This is the general method of application for many of the chemicals.

CAUTION: *Follow directions for application and precautions given on the chemical container*

Preplant incorporated

Avadex BW (400 g/L), Avadex BW Granular (10%) Controls wild oats. Apply 5.5 L/ha or 22.5 kg/ha granular product in the fall, or before seeding in the spring. The granular formulation is more suited to fall application, the liquid to spring application. Apply liquid product in 100 L/ha water. Use a suitable granular applicator to apply granular product. Refer to the Herbicide Information section for application and incorporation instructions. Fall application is recommended to avoid seedbed drying. Spring application can be done but caution is required to preserve seedbed moisture.

Avadex BW liquid may be applied with liquid fertilizer, or on a granular urea fertilizer. See the *Herbicide Information* section for specific instructions regarding application and use on dry urea fertilizer, as well as application and incorporation instructions for all formulations of Avadex BW. For aerial recommendations see Table 8. Do not seed domestic oats the year after treatment with Avadex BW.

Eptam 8-E (800 g/L) Controls wild oats, green and yellow foxtail, barnyard grass and several broadleaf weeds. (Table 6) Apply 4.25 to 5.5 L/ha in a minimum of 100 L water, in the *late fall only*, before ground freezes. Incorporate immediately according to instructions in the *Herbicide Information* section. Keep spring tillage to a minimum to conserve soil moisture.

Eptam may be applied with liquid fertilizer, or on dry granular fertilizer. See the *Herbicide Information* section for specific instructions regarding application and use on dry fertilizer.

Ro-Neet 7.2 E (720 g/L) Controls wild oats, green and yellow foxtail and several broadleaf weeds. (Table 6) Apply in the spring only at 6.25 to 7.75 L/ha in 200 to 400 L water. Use the lighter rate range on light textured soils. Incorporate thoroughly taking special precautions to avoid loss of seedbed moisture.

Preplant incorporated, Preemergence

Nortron (180 g/L) Controls wild oats, green and yellow foxtail, barnyard grass, volunteer cereal grains and several broadleaf weeds. (Table 6) Apply 8.5 to 22 L/ha in 150 to 550 L water and incorporate to a depth of 2.5 to 5.0 cm. Use the lower rate on light textured soils and the higher rate on heavier soils. Rainfall is required for activation when used as a preemergence treatment. Band application is preferable and will reduce any carry over risk to another crop the next year. Thoroughly till before planting the next crop. The addition of NaTA TCA at 5.25 to 7.90 kg/ha product or TCA solution at 7.9 to 11.8 L/ha will improve control of green foxtail and barnyard grass. Addition of Ro-Neet at 3.75 to 5.25 L/ha to Nortron will improve control of lamb's-quarters.

Preemergence

Gramoxone (200 g/L) Controls seedling weeds. Apply 2.75 to 5.5 L/ha in 300 to 550 L water. Seedling weeds that have emerged before beets show above ground will be controlled by Gramoxone. Do not apply after beet emergence since Gramoxone burns all green vegetation.

NaTA TCA (85%), TCA Solution (568 g/L) Controls green and yellow foxtail. Apply 6.25 to 10 kg/ha product NaTA TCA or 11 to 15 L/ha TCA Solution in 100 L water. Apply at planting time or immediately after. Precipitation is required for activation. Do not feed TCA treated beet tops to livestock.

Roundup (356 g/L) Controls annual weeds. Apply 2.25 L/ha in 100 L water, to actively growing grasses and broadleaf weeds less than 15 cm tall. If weeds are over 15 cm tall, apply 3.5 L/ha. Apply to emerged weeds before or after planting, but before beets show above the ground. Do not apply after beet emergence as Roundup will kill all green vegetation. Allow at least three days after treatment before disturbing the soil.

Postemergence

Basfapon (74%), Dalapon (74%), Dowpon M (74%) Controls green and yellow foxtail. Apply 1.1 to 2.2 kg/ha product Dalapon or Dowpon M or 1.1 to 1.75 kg/ha product Basfapon in a minimum of 100 L water. Apply when foxtail is from the seedling to three leaf stage, and beets have two to four leaves. Beet tops or roots may be fed to livestock.

Betanal (150 g/L) Controls green and yellow foxtail and several broadleaf weeds. (Table 6) Apply 9.5 to 11.0 L/ha in not more than 28 L water per 1 L Betanal when

kochia is less than 2.5 cm in height or diameter and prior to the four leaf stage of other weeds. Too much water may cause precipitation. When Betanal is used in combination with a preplant or preemergence herbicide, use at the rate of 7.0 to 9.5 L/ha. For control of later germinating weeds, make a second application at 7.0 to 9.5 L/ha. Allow at least seven days between first and second applications. For improved control of annual smartweed species and wild buckwheat use Betanal at 7.0 L/ha tank mixed with Herbicide 273 at 1.5 to 3.25 L/ha. Use the higher rate of Herbicide 273 only on well established four to six leaf beets which are not under stress.

Betanex (150 g/L) Controls several broadleaf weeds. (Table 6) Apply 5.5 to 9.5 L/ha in 200 to 400 L water before wild buckwheat and stinkweed reach the two leaf stage and prior to the four leaf stage of red root pigweed, lamb's quarters and wild mustard. For control of later germinating weeds, make a second application at 5.5 to 9.5 L/ha. Allow at least seven days between first and second application. For improved control of annual smartweed species and wild buckwheat, use Betanex at 7.0 L/ha tank mixed with Herbicide 273 at 1.5 to 3.25 L/ha. Use the higher rate of Herbicide 273 only on well established four to six leaf beets which are not under stress.

Betanal (150 g/L) and Betanex (150 g/L) Controls weeds susceptible to Betanal and Betanex. Mix volume for volume and apply the mix at 5.5 to 9.5 L/ha in 200 to 400 L water. For control of later germinating weeds, make a second application of a 1.1 tank mix at 5.5 to 7.0 L/ha. Allow at least seven days between first and second application.

For improved control of annual smartweed species and wild buckwheat use Betanal at 3.5 L/ha plus Betanex at 3.5 L/ha tank mixed with Herbicide 273 at 1.5 to 3.25 L/ha. Use the higher rate of Herbicide 273 only on well established four to six leaf beets which are not under stress.

Precautions required when using Betanal and Betanex include avoiding spraying when the crop is under stress from rapid climatic change from cool, overcast to hot, bright days, windy conditions, drought, use of preemergent herbicides, insect or disease injury, and close cultivation. Under such circumstances it is recommended to delay application until conditions are more favourable. Do not spray while dew is present or if rainfall is expected within six hours.

NOTE: *Evening spraying is recommended*

Carbyne 2EC (240 g/L) Controls wild oats. Apply at 1.75 to 3.5 L/ha in 45 L water. Direct nozzles 45° forward and use a nozzle pressure of 300 kPa. Application should be made when the majority of wild oats are in the two leaf stage. Do not spray when foliage is wet from dew or rain. At the higher rate some buckwheat control can be expected as well. Refer to the *Herbicide Information* section for specific application instructions.

Herbicide 273 (360 g/L) Controls several broadleaf weeds (Table 6). Apply 2.25 to 4.75 L/ha in 90 to 280 L water. Apply when beets are in the four leaf stage and temperature is between 15° to 26°C. Use rates proportional to weed size and lower rates where herbicides were applied previously. Do not apply later than 40 days after beet emergence.

Hoe-Grass (190 g/L) Controls wild oats, green and yellow foxtail and barnyard grass. Apply 5.25 L/ha in at least 110 L water with nozzles directed 45° forward. Spray at one to four leaf stage of the weeds, before they tiller. Other herbicides for broadleaf weed control must be applied at least four days after Hoe-Grass application. Do not apply if rain is expected within one hour. Refer to *Herbicide Information* section for application instructions.

NaTA TCA (85%), TCA Solution (568 g/L) Controls green and yellow foxtail. Apply 4.48 kg/ha product NaTA TCA or 5.5 to 9.0 L/ha TCA Solution in 100 L water. Apply before the foxtail is 5 cm tall and before sugar beets have four leaves. Do not feed TCA treated beet tops to livestock.

Poast (184 g/L) Controls several grassy weeds. See Table 6. Apply 0.8 to 1.0 L/ha for control of green and yellow foxtail, barnyard grass, proso millet, witchgrass and volunteer corn; 1.4 to 1.6 L/ha for control of wild oats; 1.6 L/ha for control of volunteer wheat and volunteer oats; or 1.9 L/ha for control of volunteer barley. Where a rate range is specified for a weed, use the higher rate to control heavy infestations. Apply in 50 to 250 L/ha water at a minimum pressure of 240 kPa. Include Assist Oil Concentrate at 0.75 to 2.0 L/ha. Use the higher rate when applying the higher recommended spray volumes. Apply when weeds are in the one to six leaf stage with the majority in the two to five leaf stage. Control may be reduced if grasses are not actively growing due to drought, flooding, or prolonged cool temperatures (15° C or less). Do not apply using floodjet or hollow cone nozzles. For aerial recommendations see Table 8.

Sunflowers

Preplant incorporated

Amiben (240 g/L) plus Treflan EC (545 g/L) Controls wild oats, green and yellow foxtail, barnyard grass and several broadleaf weeds. See *Field Crops Chart.* Apply Amiben at 9.25 L/ha *only as a tank mix* with Treflan at 1.5 to 2.0 L/ha in at least 100 L water. Apply to a dry soil surface in the spring before planting, and incorporate immediately (within 24 hours) according to instructions for Treflan in the *Herbicide Information* section.

Eptam 8-E (800 g/L), Eptam 10 G (10% granular) Controls wild oats, green and yellow foxtail, barnyard grass, volunteer cereals and several broadleaf weeds. See *Field Crops Chart.*

Spring application

Apply 4.25 L/ha or 34 kg/ha granular product. Apply liquid in a minimum of 100 L water, and granular

product with a suitable granular applicator. Eptam must be applied to a dry soil surface of a well prepared seedbed. Incorporate immediately following instructions in the *Herbicide Information* section. Do not use on soils with less than three percent organic matter.

Fall application

Apply 4.25 to 5.5 L/ha or 34 to 45 kg/ha granular product. The liquid product should be applied in a minimum of 100 L/ha water. Apply in late fall just before freeze-up to a dry soil surface of a well-prepared seedbed. Incorporate immediately according to instructions in the *Herbicide Information* section.

Eptam 8-E may be applied with liquid fertilizer, or on granular fertilizer. See the *Herbicide Information* section for specific instructions regarding application and use on dry fertilizer.

Treflan EC (545 g/L), Treflan QR5 (5%) Controls wild oats, green and yellow foxtail, barnyard grass and several broadleaf weeds. See *Field Crops Chart*

Spring application

Apply 1.5 to 2.6 L/ha or 17 to 28 kg/ha granular product as a preplant application. The liquid should be applied in at least 100 L/ha water and the granular product should be applied with a suitable granular applicator. Incorporate according to instructions in the *Herbicide Information* section.

Fall application

Apply 2.0 to 3.0 L/ha or 22 to 34 kg/ha granular product. The liquid product should be applied in at least 100 L/ha water. Granular product should be applied with a suitable granular applicator between September 1 and freeze-up. Incorporate according to instructions in the *Herbicide Information* section. Treflan leaves a residue in the soil which may affect subsequent crops.

See *Herbicide Information* section for susceptible crops.

Preemergence

Sencor 500 F (500 g/L), Sencor 75 DF (75%) For suppression of wild mustard, volunteer rapeseed, annual smartweed species (lady's thumb), stinkweed and red root pigweed, apply 425 to 550 mL/ha Sencor 500 F or 275 to 375 g/ha Sencor 75 DF in 80 to 100 L water. Use the higher rate on medium and heavy textured soils having more than five percent organic matter. Do not use on any soils containing less than three percent organic matter. Seed sunflowers to a depth of at least 5 cm. Apply Sencor and incorporate within two days of planting and prior to crop emergence. Shallow incorporate to a depth of 2 to 3 cm with two passes using harrows. On variable soils some injury may occur in sandy areas if the rate used is for the heavier soil of the field. Application made before heavy rainfall or irrigation (3 cm or more) may cause crop injury ranging from leaf burn to stand reduction. Risk of injury is greatest on light soils containing less than four percent organic matter. If surface moisture is low and/or weeds germinate below the chemical layer, control may not be adequate.

CAUTION: *Sunflowers must be seeded at least 2 cm below Sencor treated layer to avoid severe stand reduction. Seed sunflowers at the highest recommended rates to minimize stand thinning.*

Postemergence

Sunflowers are extremely sensitive to broadleaf herbicides such as 2,4-D, MCPA and Banvel. Ensure that sprayers are thoroughly cleaned before applying herbicides to sunflowers. The Manitoba Agriculture publication *Field Sprayers* contains detailed instructions on cleaning spryers.

Hoe-Grass (190 g/L) Controls wild oats, green and yellow foxtail, and barnyard grass. Apply 3.75 L/ha in at least 110 L water with nozzles directed 45° forward. Apply at one to four leaf stage and before tillering of the weeds. Herbicides for broadleaf weed control must be applied at least four days after Hoe-Grass application. Do not apply if rain is expected within one hour. Do not apply in hot, humid weather as crop injury may result. Do not apply to the variety Corona. Refer to *Herbicide Information* section for application instructions.

Matavon (84 g/L) Controls wild oats. Apply 5 to 6.5 L/ha broadcast or 6.5 L/ha as a band application in 100 L water at a minimum nozzle pressure of 300 kPa when the majority of the wild oats are in the three to six leaf stage and before the crop forms a canopy. Refer to the *Herbicide Information* section for additional instructions. For aerial recommendations see Table 8.

Perennial weed control

Perennial thistles

Canada thistle and perennial sow-thistle control requires a combined program of treatment in the crop and in stubble after harvest. Control on summerfallow can also be used as a part of a combination program. Follow a program of using a recommended control in the crop and one of the following after harvest or on summerfallow:

Kil-mor (500 g/L) Apply 1.10 to 1.75 L/ha in at least 100 L water when thistles are actively growing after harvest. Do not cultivate before treatment and allow three weeks after treatment before cultivation. On summerfallow apply when thistles are in the early bud stage and allow three weeks after treatment before resuming normal summerfallow tillage.

MCPA amine and sodium salt Apply 2.25 L/ha of formulations containing 500 g/L MCPA in 100 L water. For product volumes of other MCPA formulations see Table 10. Refer to Kil-mor recommendation for additional detail on tillage.

Target (400 g/L) Apply 1.5 to 2.0 L/ha in a minimum of 100 L water. Apply after harvest when thistles have 15 to 20 cm of regrowth. Do not cultivate before treatment and allow three weeks after treatment before cultivation. On summerfallow, apply when thistles are in the early bud stage and allow three weeks after treatment before resuming normal summerfallow tillage.

2,4-D amine Apply 2.25 L/ha of formulations containing 500 g/L 2,4-D in 100 L water. Product volumes of various 2,4-D formulations are given in Table 10. Refer to Kil-mor recommendation for additional detail on tillage.

The following treatments generally give a higher level of perennial thistle control. Due to treatment cost, patch treatment is recommended.

Amitrol-T (200 g/L) Apply 22 to 35 L/ha in 500 L water for patch treatment of thistles. Apply when thistles are in the early flowering stage. Use the higher rate during periods of cool or dry weather. Allow three weeks after treatment before cultivation. Do not apply after October 1.

Banvel (400 g/L) Apply 3 L/ha in 100 to 200 L water when thistles are actively growing after harvest and at least two weeks before killing frost. Allow three weeks after treatment before cultivating. On summerfallow, apply when thistles are in the early bud stage and allow three weeks after treatment before resuming normal summerfallow tillage. Grow only cereals, soybeans or field corn the year after application of Banvel at 3 L/ha. If application is made after September 1, or if very dry conditions persist after application, injury to crops (including cereals, soybeans and field corn) may occur in the spring following application. Do not graze or harvest for dairy feed within 14 days of application. Meat animals grazed on or fed forage harvested within 28 days of Banvel application should not be slaughtered until a further 28 day period has elapsed.

Banvel 5G (5%) Apply 80 to 110 kg/ha product for spot treatment. Use the lower rate when thistles are in the pre-bud stage. Patch treat in crop when plants are actively growing. On summerfallow apply to weed patches following a cultivation in the spring. For best results apply when thistles are in the pre-bud stage. On stubble, apply to regrowth after harvest and at least two weeks before a frost to land being fallowed the following year. Banvel 5G will leave a soil residue the following year. Plant only to barley, oats or spring wheat. Yield may be reduced in the treated area because of soil residue. Liquid Banvel treatments require lower rates of application and will leave less residue.

Meat animals grazed on or fed forage harvested within 28 days of Banvel application should not be slaughtered until a further 28 day period has elapsed. Avoid grazing dairy cattle or harvesting for dairy feed within 60 days of treatment. Banvel 5G should not be applied where roots of desirable trees or plants may extend into treated soil.

Roundup (356 g/L) For Canada thistle control, apply 6 L/ha in 100 L water or 75 to 125 mL in 6.5 L water/100 square metres. Use when the Canada thistle is in the bud to bloom stage and actively growing. For perennial sow-thistle control, apply 7 to 12 L/ha in 100 L water. Do not cultivate for at least five days after treatment for Canada thistle and wait at least seven days for perennial sow-thistle. See *Herbicide Information* section for specific application instruction.

Quackgrass

See the fact sheet *Integrated Weed Control Recommendations* for tillage recommendations for quackgrass control.

Amitrol T, Basfapon, Dalapon, Dowpon M and TCA are registered for quackgrass control but are not recommended as level of control is generally less than with the following recommendation.

Roundup (356 g/L) Apply 4.75 to 7 L/ha in 100 L water or 75 to 125 mL in 6.5 L water/100 square metres. Use when the quackgrass is at least 20 cm tall and actively growing. If a frost occurrs, wait several days to determine if the quackgrass has recovered. Quackgrass can be treated after a mild frost provided there are three to four green leaves actively growing at the time of application. Do not cultivate before treatment or for at least five days after treatment. See *Herbicide*

Information section for specific application instructions.

Roundup at the reduced rate of 2.5 L/ha in the fall will provide top growth control of quackgrass for the next growing season. Apply in 50 to 100 L/ha of clean water using flat fan nozzles when quackgrass is at least 20 cm in height with three to four leaves and actively growing. Do not till between harvest and fall application. Allow at least five days after application before tillage. If frost has occurred wait several days to determine the quackgrass has recovered. Quackgrass can be treated after a mild frost provided there are three to four leaves actively growing at the time of application. If quackgrass is sodbound (dense infestations undisturbed for two or more years) control will be reduced. Retreatment of quackgrass patches may be required on an annual basis.

Fall weed control

Fall tillage to control annual weeds should be shallow to avoid burying seeds below a depth of 8 cm (3 inches). For the most effective fall thistle control spray regrowth after harvest and leave undisturbed for three weeks after application of the herbicide. Cultural practices can then be carried out as desired.

Preplant incorporated

Fall application of incorporated herbicides can result in less drying of the seedbed than spring applications. If soil erosion is likely to be a problem, fall applications should be avoided. Granular herbicides can be applied under trashy conditions and may permit fall application without creating an erosion problem.

NOTE: *Specific instructions for the following treatments are included in crop recommendations.*

Avadex BW (liquid or granular) for control of wild oats in wheat, barley, flax, rapeseed, mustard and sugar beets. The granular formulation is more suited to fall application.

The following treatments give control of wild oats, green and yellow foxtail and several broadleaf weeds:

Eptam 8-E (liquid) for use on flax, sugar beets and sunflowers

Eptam 10 G for use on flax and sunflowers.

Treflan EC (liquid) for use on dry beans, fababeans, flax, lentils, mustard, peas, rapeseed and sunflowers

Treflan QR5 (granular) for use on lentils, mustard, peas, rapeseed, sunflowers and flax

Postemergence

Embutox E (400 g/L), 2,4-D Butyric 400 (400 g/L) Controls seedling narrow-leaved hawk's-beard in alfalfa. Apply 3.5 L/ha in 150 to 200 L water.

MCPA amine or mixtures of sodium and potassium salts or 2,4-D amine or LV ester Controls winter annuals such as flixweed, stinkweed and shepherd's purse. Apply 1.1 L/ha of formulations containing 500 g/L MCPA or 2,4-D in 100 L water in late fall before freeze-up. Product volumes of other MCPA and 2,4-D formulations are given in Table 10. Stinkweed becomes an overwintered plant resistant to 2,4-D or MCPA by the time the spring seeded crop is in the four leaf stage.

2,4-D amine or LV ester Controls dog mustard and leafy spurge. Apply 2.25 L/ha of formulations containing 500g/L 2,4-D in 100 L water. Product volumes of other 2,4-D formulations are given in Table 10.

For Canada thistle, sow-thistle and quackgrass control refer to the Perennial Weed Control section.

Chemical fallow

Roundup (356 g/L) Controls annual grasses, quackgrass, and several annual and perennial broadleaf weeds including absinthe, annual blue grass, annual sow thistle, Canada blue grass, Canada thistle, cattail, common milkweed, common ragweed, curled dock, downy brome, field bindweed, green and yellow foxtail, hemp dogbane, hoary cress, Kentucky blue grass, knotweed, kochia, lady's thumb, lamb's quarters, prickly lettuce, mustard, poison ivy, quackgrass, red root pigweed, Russian thistle, shepherd's purse, smooth brome grass, toadflax, wild buckwheat, wild oats and wild vetch.

Apply 2.25 L/ha in 100 to 300 L water for annuals less than 15 cm tall or 3.5 L/ha for annuals greater than 15 cm tall. For perennial weed control consult the Perennial Weed Control section and Special Weed Problems section. Do not apply when weeds are under stress conditions such as drought or extreme temperatures. See *Herbicide Information* section for specific application instructions.

Sweep (250 g/L) Controls wild oats, green and yellow foxtail, and volunteer cereal grains. Apply 2.25 L/ha in a minimum of 100 L water. Apply when weeds are in the two to four leaf stage. If broadleaf weeds are present, Sweep may be tank mixed with a broadleaf herbicide such as 2,4-D, MCPA, Banvel plus 2,4-D, Dyvel, Kil-mor, Brominal M, Buctril M, Afolan F or Lorox L plus MCPA at recommended rates. Do not apply Afolan F or Lorox L more than once during the season.

Zero tillage

Roundup (356 g/L) plus a non-ionic surfactant Controls wild oats, green and yellow foxtail and wild

mustard. Apply 1.1 L/ha of Roundup plus 350 mL of a non-ionic surfactant in 100 L of clear water.

Application should be made just prior to seeding, or after seeding but before crop emergence. Apply when weeds are in the seedling stage, not more than 15 cm high.

Roundup (356 g/L) plus a non-ionic surfactant, plus Pardner (225 g/L), Torch (227 g/L), or Torch DS (450 g/L) Controls wild oats, green and yellow foxtail, volunteer cereal grains, lady's thumb, lamb's quarters, wild buckwheat and wild mustard. Apply the same rate of Roundup plus surfactant as above plus 1.4 L/ha of Pardner or Torch or 700 mL/ha of Torch DS in 100 L of clear water.

Forage Crops

Plan your weed control program before seeding forage crops. Consider the weeds found in the field and control measures available. Perennial crops reduce flexibility and require long term planning. Effective weed control before planting and in the establishment year reduces weed problems for the remainder of the stand life.

Most forage crops are competitive and suppress weed growth. Once the forage is established, annual weeds will have difficulty becoming established. Perennial weeds may be a problem and shorten the life of the forage stand. Control perennial weeds before establishment of forage crops or plan for adequate control in the crop.

When mixed stands of grasses and legumes are grown, herbicide choice is limited. Be sure the herbicide can be used on all forages in the mixture. For grass-legume mixes use of broadleaf herbicides will be most limited by the legume while use of herbicides for grassy weed control will be most restricted by the forage grass.

Cover crops also limit herbicide use. Be sure the herbicide is recommended for both the forage and cover crop. The *Forage Crops Chart* contains a summary of recommended herbicides.

Seedling legumes

Preplant or preemergence (but postemergence to weeds)

Roundup (356 g/L) Controls annual broadleaf and grass weeds. See *Forage Crops Chart.* Apply 2.25 to 3.5 L/ha in 100 to 300 L water to emerged vegetation before or after planting but prior to forage legumes emerging. Use the higher rate when weeds are greater than 15 cm tall. See the *Herbicide Information* section for specific application instructions and the *Special Weed Problems* section for perennial weed problems information.

Alfalfa

Preplant incorporated

Avadex BW (400 g/L), Avadex BW Granular (10%) Controls wild oats in alfalfa sown with a barley, flax or wheat cover crop. Apply in barley or flax cover crops at 4.25 L/ha or 17.5 kg/ha granular product in the fall or before seeding in the spring. Apply in wheat cover crops at 3.5 L/ha or 15 kg/ha granular product in the fall or in the spring after seeding wheat but before seeding alfalfa. The granular formulation is more suited to fall applications, the liquid to spring applications. Apply the liquid product in 100 L/ha water. Use a suitable granular applicator to apply the granular product. See the *Herbicide Information* section for application and incorporation instructions.

Eptam 8-E (800 g/L), Eptam 10 G (10%) Controls wild oats, green and yellow foxtail, barnyard grass, volunteer cereal grains and several broadleaf weeds. See *Forage Crops Chart.* Apply 4.25 L/ha or 34 kg/ha granular product in the spring. Apply liquid in a minimum of 100 L/ha water. The granular product should be applied with a suitable granular applicator. Eptam must be applied to the dry soil surface of a well prepared seedbed. See the *Herbicide Information* section for application and incorporation instructions. Temporary crop stunting and sealing of the first leaves will occur in legumes if conditions for germination and growth are not optimum. Do not use Eptam if a grass or cover crop is to be planted with the alfalfa.

Eptam 8-E may be applied on granular fertilizer. See the *Herbicide Information* section for specific instructions regarding application and use on dry fertilizer.

Postemergence

Asulox F (400 g/L) For seed production only. Controls wild oats, suppression of green and yellow foxtail, barnyard grass and several broadleaf weeds. See *Forage Crops Chart.* Apply 2.75 L/ha in 50 to 100 L water. Use when wild oats are in the two to four leaf stage. It may be applied to alfalfa alone or with a flax cover crop. Do no graze or harvest for livestock feed in the treatment year.

Asulox F (400 g/L) plus Embutox E (400 g/L) For seed production only. Controls wild oats and several broadleaf weeds, suppression of green and yellow foxtail. See *Forage Crops Chart.* Apply 2.75 L/ha Asulox F tank mixed with Embutox E at 1.5 L/ha in 50 to 100 L water when wild oats are in the two to four leaf stage. Do not use if a cover crop is planted with the alfalfa. Do not graze or harvest for livestock feed in the treatment year.

Avenge 200 C (200 g/L) Controls wild oats in alfalfa sown with a barley or wheat (Neepawa, Glenlea, Selkirk, Chester, Macoun, Canuck, or Benito only) cover crop. Apply 3.5 to 4.25 L/ha in 100 L water. Use the high rate when there are more than 200 wild oat plants per square metre. Nozzle tip pressure should be 276 kPa. Have nozzles spray at a 45° angle in the direction of travel. Apply to a dry crop (no dew or rain) before the cover crop is in the six leaf stage and when wild oats are in the three to five leaf stage. Do not graze or harvest the treated alfalfa for forage in the year of treatment. Do not apply if rain is forecast within six hours. Allow a four day interval between application of Avenge and herbicides for control of broadleaf weeds. See *Herbicide Information* section for application instructions. For aerial recommendations see Table 8.

Basfapon (74%), Dalapon (74%), Dowpon (74%), Dowpon M (74%) Controls green and yellow foxtail, and barnyard grass.

Alfalfa alone

Apply Basfapon at 2.25 to 4.0 kg/ha product, Dalapon at 2.25 to 3.25 kg/ha product, Dowpon or Dowpon M at 2.2 to 3.4 kg/ha product in 300 L water when the grass seedlings are small and the alfalfa is 5 to 8 cm tall. Do not feed first year cuttings to dairy animals, or animals being finished for slaughter.

Alfalfa underseeded to flax

Apply Basfapon, Dalapon, Dowpon or Dowpon M at 1.1 to 1.75 kg/ha product in 300 L water before foxtail or barnyard grass reaches the three leaf stage and when flax is 10 to 15 cm tall.

Cobutox (400 g/L), Embutox E (400 g/L), 2,4-D Butyric 400 (400 g/L) Controls several broadleaf weeds. See *Forage Crops Chart.* Apply 3 to 3.5 L/ha in 150 to 200 L water when the alfalfa is in the first to third trifoliolate leaf stage. May be applied to alfalfa alone or with a barley, oats, or wheat cover crop. If wild mustard is beyond the four leaf stage, Cobutox or Embutox E at the reduced rate of 2 L/ha may be tank mixed with MCPA sodium salt (300 g/L) at 117 mL/ha. For product volumes of other MCPA formulations see Table 10. This tank mix may increase crop damage.

For control of narrow-leaved hawk's beard seedlings apply Embutox E or 2,4-D Butyric 400 at 3.5 L/ha in 150 to 200 L water in fall, after legume growth ends.

Dalapon see Basfapon

Dowpon M see Basfapon

Embutox E see Cobutox

Hoe-Grass (190 g/L) Controls wild oats, green and yellow foxtail and barnyard grass. Apply 3.75 L/ha in at least 110 L water with a nozzle pressure of 275 kPa directing nozzles 45° forward. Apply at one to four leaf stage of the weeds, before they tiller. Other herbicides for broadleaf weed control must be applied at least four days after the Hoe-Grass application. Apply only in the year of establishment. Do not graze or harvest for livestock feed in the treatment year. Avoid application if rain is expected within one hour. See the *Herbicide Information* section for application instructions. Hoe-Grass may be applied to alfalfa alone or with a barley, flax or wheat cover crop.

Mataven (84 g/L) For seed production only. Controls wild oats. Apply 5 L/ha in 100 L water at a minimum nozzle pressure of 300 kPa when the majority of wild oats are in the three to six leaf stage. Apply to alfalfa alone or with a wheat (except Selkirk) cover crop. See the *Herbicide Information* section for application instructions. Do not graze or harvest for livestock feed in the treatment year. For aerial recommendations see Table 8.

MCPA amine and potassium sodium salt mixtures. Controls several broadleaf weeds. See *Forage Crops Chart. Use only on alfalfa sown with a flax cover crop.* Apply 700 mL/ha of formulations containing 500 g/L MCPA.

For product volumes of other MCPA formulations see Table 10. Apply these chemicals in 150 to 200 L water to reduce the risk of injury when the seedling legumes are in the first to third trifoliolate leaf stage. A good canopy formed by the companion crop and /or weeds will reduce the risk of injury. Spray before legumes reach 10 cm in height.

NOTE: *The use of MCPA amine and potassium sodium salt mixtures on alfalfa with a cereal cover crop, while registered, is not recommended as serious damage to alfalfa may result.*

MCPA Sodium Salt (300 g/L) Controls several broadleaf weeds. See *Forage Crops Chart. Use only on alfalfa sown with a flax cover crop.* Apply 1.2 to 1.4 L/ha in 150 to 200 L water to reduce the risk of injury when the seedling legumes are in the first to third trifoliolate leaf stage. For product volumes of other MCPA formulations see Table 10.

NOTE: *The use of MCPA sodium salt on alfalfa with a cereal cover crop, while registered, is not recommended as serious damage to alfalfa may result.*

2,4-D amine The use of 2,4-D amine on alfalfa with a cereal cover crop, while registered, is not recommended as serious damage to alfalfa may result.

2,4-D Butyric 400 see Cobutox

Birdsfoot trefoil

Preplant incorporated

Avadex BW (400 g/L), Avadex BW Granular (10%) Controls wild oats in birdsfoot trefoil underseeded to barley, flax or wheat. Apply in barley or flax cover crops at 4.25 L/ha or 17.5 kg/ha granular product in the fall or before seeding in the spring. Apply in wheat cover crops at 3.5 L/ha or 15 kg/ha granular product in the fall or in the spring after seeding wheat but before seeding trefoil. The granular formulation is more suited to fall applications, the liquid to spring application. Apply the liquid product in 100 L/ha water. Use a suitable granular applicator to apply the granular product. See the *Herbicide Information* section for application and incorporation instructions.

Eptam 8-E (800 g/L), Eptam 10 G (10%) Spring application only. Controls wild oats, green and yellow foxtail, barnyard grass, volunteer cerealgrains and several broadleaf weeds. See *Forage Crops Chart.* Apply 4.25 L/ha or 34 kg/ha granular product. Use liquid in a minimum of 100 L/ha water. Apply the granular product with a suitable granular applicator. Eptam should only be applied to the dry surface of a well prepared seedbed. See the *Herbicide Information*

section for incorporation instructions. Temporary crop stunting and sealing of the first leaves will occur in legumes if conditions for germination and growth are not optimum. Do not use Eptam if a grass or cover crop is to be planted with the birdsfoot trefoil.

Eptam 8-E may be applied on granular fertilizer. See the *Herbicide Information* section for specific instructions regarding application and use on dry fertilizer.

Postemergence

Avenge 200 C (200 g/L) Controls wild oats in birdsfoot trefoil sown with a barley or wheat (Neepawa, Gleanlea, Selkirk, Chester, Macoun, Canuck, or Benito only) cover crop. Apply 3.5 to 4.25 L/ha in 100 L water. Use the high rate when there are more than 200 wild oat plants per square metre. Nozzle tip pressure should be 276 kPa. Have nozzles spray at a 45° angle in the direction of travel. Apply to a dry crop (no dew or rain) before the cover crop is in the six leaf stage and when wild oats are in the three to five leaf stage. Do not graze or harvest the treated birdsfoot trefoil for forage in the year of treatment. Do not apply if rain is forecast within six hours. Allow a four day interval between application of Avenge and herbicides for control of broadleaf weeds. See *Herbicide Information* section for application instructions. For aerial recommendations see Table 8.

Basfapon (74%), Dalapon (74%), Dowpon (74%), Dowpon M (74%) Controls green and yellow foxtail, barnyard grass.

Birdsfoot trefoil alone

Apply Basfapon at 2.25 to 4.0 kg/ha product, Dalapon at 2.25 to 3.25 kg/ha product, Dowpon or Dowpon M at 2.2 to 3.4 kg/ha product in 300 L water when the grass seedlings are small and the birdsfoot trefoil is 5 to 8 cm tall. Do not feed first year cuttings to dairy animals, or animals being finished for slaughter.

Birdsfoot trefoil underseeded to flax

Apply Basfapon, Dalapon, Dowpon or Dowpon M at 1.1 to 1.75 kg/ha product in 300 L water before foxtail or barnyard grass reaches the three leaf stage and when flax is 10 to 15 cm tall.

Cobutox (400 g/L), Embutox E (400 g/L), 2,4-D Butyric 400 (400 g/L) Controls several broadleaf weeds. See *Forage Crops Chart.* Apply 3 to 3.5 L/ha in 150 to 200 L water when the birdsfoot trefoil is in the first to third trifoliolate leaf stage. May be applied to birdsfoot trefoil alone or with a barley, oats or wheat cover crop. If wild mustard is beyond the four leaf stage, Cobutox or Embutox E at the reduced rate of 2 L/ha may be tank mixed with MCPA sodium salt (300 g/L) at 117 mL/ha. For product volumes of other MCPA formulations see Table 10. This tank mix may increase crop damage.

Embutox E see Cobutox

2-4-D Butyric 400 see Cobutox

Clover
Alsike, red and sweet

Preplant incorporated

Avadex BW (400 g/L), Avadex BW Granular (10%) Controls wild oats in alsike, red or sweet clover underseeded to barley, flax or wheat. Apply in barley or flax cover crops at 4.25 L/ha or 17.5 kg/ha granular product in the fall or before seeding in the spring. Apply in wheat cover crops at 3.5 L/ha or 15 kg/ha granular product in the fall or in the spring after seeding wheat but before seeding clover. The granular formulation is more suited to fall applications, the liquid to spring applications. Apply the liquid product in 100 L/ha water. Use a suitable granular applicator to apply the granular product. See the *Herbicide Information* section for application and incorporation instructions.

Postemergence

Avenge 200 C (200 g/L) Controls wild oats in red or sweet clover sown with a barley or wheat (Neepawa, Glenlea, Selkirk, Chester, Macoun, Canuck, or Benito only) cover crop. Apply 3.5 to 4.25 L/ha in 100 L water. Use the high rate when there are more than 200 wild oat plants per square metre. Nozzle tip pressure should be 276 kPa. Have nozzles spray at a 45° angle in the direction of travel. Apply to a dry crop (no dew or rain) before the cover crop is in the six leaf stage and when wild oats are in the three to five leaf stage. Do not graze or harvest the treated red or sweet clover for forage in the year of treatment. Do not apply if rain is forecast within six hours. Allow a four day interval between application of Avenge and herbicides for control of broadleaf weeds. See *Herbicide Information* section for application instructions. For aerial recommendations see Table 8.

Cobutox (400 g/L), Embutox E (400 g/L), 2,4-D Butyric 400 (400 g/L) Controls several broadleaf weeds. See *Forage Crops Chart. Apply to alsike and white dutch clover only* at 3.0 to 3.5 L/ha in 150 to 200 L water. Use when clover is in the first to third trifoliolate leaf stage. The 3.5 L/ha rate will control seedling narrow-leaved hawk's beard. May be applied to alsike or white dutch clover alone or with a barley, oats or wheat cover crop.

Embutox E see Cobutox

Hoe-Grass (190 g/L) Controls wild oats, green and yellow foxtail and barnyard grass. *Apply to red and sweet clover only* at 3.75 L/ha in at least 110 L water with a nozzle pressure of 275 kPa. Direct nozzles 45° forward. Apply at one to four leaf stage of the weeds, before they tiller. Other herbicides for broadleaf weed control must be applied at least four days after Hoe-Grass application. Use only in the year of establishment. Do not graze or harvest for livestock feed in the treatment year. If rain is expected within one hour, do not apply. See the *Herbicide Information* section for application instructions. May be applied to red or sweet clover alone or with a barley, flax or wheat cover crop.

MCPA amine and potassium sodium salt mixtures Controls several broadleaf weeds. See *Forage Crops Chart. Use only on red or alsike clover sown with a flax cover crop.* Apply 700 mL/ha of formulations containing 500 g/L MCPA. For product volumes of other MCPA formulations see Table 10. Apply these chemicals in 150 to 200 L water to reduce the risk of injury when the seedling legumes are in the first to third trifoliolate leaf stage. A good canopy formed by the companion crop and/or weeds will reduce the risk of injury. Do not spray legumes once a height of 10 cm is reached.

NOTE: *The use of MCPA amine and potassium sodium salt mixtures on red or alsike clover with a cereal cover crop, while registered, is not recommended as serious damage to clover may result.*

MCPA sodium salt (300 g/L) Controls several broadleaf weeds. See *Forage Crops Chart. Use only on red or alsike clover sown with a flax cover crop.* Apply 1.2 to 1.4 L/ha in 150 to 200 L water to reduce the risk of injury when the seedling legumes are in the first to third trifoliolate leaf stage. Do not use on sweet clover. For product volumes of other MCPA formulations see Table 10.

NOTE: *The use of MCPA sodium salt on red or alsike clover with a cereal cover crop, while registered, is not recommended as serious damage to clover may result.*

CAUTION: *Do not use MCPA on sweet clover at any stage of growth.*

Tropotox Plus (400 g/L) Controls several broadleaf weeds. See *Forage Crops Chart. Apply to red, alsike, and white dutch clover only* at 3 to 3.5 L/ha in 150 to 200 L water when clover is in the first to third trifoliolate leaf stage. May be applied to clover alone or with a barley, oats or wheat cover crop.

2,4-D amine The use of 2,4-D amine on clovers with a cereal cover crop, while registered, is not recommended as serious damage to clover may result.

2,4-D Butyric 400 see Cobutox

Seedling grasses

Treflan residues in the soil may damage seedling forage grasses. Do not seed forage grasses for 18 months after a spring application or 22 months after a fall application of Treflan.

Preplant or preemergence, (but postemergence to weeds)

Roundup (356 g/L) Controls annual broadleaf and grass weeds. Apply 2.25 to 3.5 L/ha in 100 to 300 L water. Apply to emerged vegetation prior to or after planting but before emergence of forage grasses. Use the high rate when weeds are greater than 15 cm tall. See the *Herbicide Information* section for specific application instructions. For control of perennial weed problems, see the *Special Weed Problems* section.

Postemergence

Avenge 200 C (200 g/L) Controls wild oats in creeping red fescue, bromegrass, timothy, crested wheatgrass, orchardgrass, Russian wild ryegrass, reed canarygrass, and Kentucky bluegrass underseeded to barley or wheat (Neepawa, Glenlea, Selkirk, Chester, Macoun, Canuck or Benito only). Apply 3.5 to 4.25 L/ha in 100 L water. Use the high rate when there are more than 200 wild oat plants per square metre. Nozzle tip pressure should be 276 kPa. Have nozzles spray at a 45° angle in the direction of travel. Apply to a dry crop (no dew or rain) when wild oats are in the three to five leaf stage and prior to the six leaf stage of the cover crop. Do not graze or harvest the seedling grasses for forage during the year of treatment. Do not apply if rain is forecast within six hours. Do not tank mix with any herbicides for broadleaf weed control. Allow a four day interval between application of Avenge and herbicides for control of broadleaf weeds. See *Herbicide Information* section for application instructions. Refer to Table 8 for aerial recommendations.

Banvel (400 g/L) Controls several broadleaf weeds. See *Forage Crops Chart. Apply to red fescue only.*

Red fescue alone

Apply at 700 mL/ha in 110 L water when the crop is 5 cm tall or in the three leaf stage. May be mixed with 2,4-D or MCPA.

Red fescue sown with barley, oats or wheat cover crops.

Apply at 275 mL/ha on barley or 350 mL/ha on wheat or oat cover crops in 110 L water. Apply when grasses are 5 cm tall or in the three leaf stage. May be mixed with 2,4-D or MCPA.

Buctril M (450 g/L) Controls several broadleaf weeds. See *Forage Crops Chart.* Apply to bromegrass, creeping red fescue, crested wheatgrass, intermediate wheatgrass, meadow fescue, orchardgrass, reed canarygrass, Russian wild ryegrass, slender wheatgrass, tall wheatgrass and timothy, alone or underseeded to wheat, barley, oats, or flax. Apply 1.25 L/ha in 150 L water at a pressure of 275 kPa when forage grasses are in the two to four leaf stage and weeds are small. Do not graze or harvest for livestock feed in the year of application.

Hoe-Grass (190 g/L) Controls wild oats, green and yellow foxtail and barnyard grass. *Apply to brome, intermediate wheat grass, Russian wild rye, creeping red fescue, or crested wheat grass only,* alone or with a barley, flax or wheat cover crop, at 3.75 L/ha in at least 110 L water with a nozzle pressure of 276 kPa Direct nozzles 45° forward. Apply at one to four leaf stage of the weeds, before they tiller. Hoe-Grass may be tank mixed with 1.25 L/ha of Torch. Other herbicides for broadleaf weed control must be applied at least four days after Hoe-Grass application. Use only in the year of establishment and do not graze or harvest for livestock feed in the treatment year. Avoid applying if rain is expected within one hour. See the

Herbicide Information section for application instructions.

Matavon (84 g/L) For seed production only. Controls wild oats. Apply 5.0 to 7.5 L/ha when the majority of the wild oats are in the three to six leaf stage to bromegrass, meadow fescue, creeping red fescue, Russian wild ryegrass, or intermediate wheatgrass in the year of seeding. Use the high rate when grasses are grown without a companion crop and low rate when grown with wheat (except Selkirk) as a companion crop. Do not graze or harvest for forage in the year of treatment. See the *Herbicide Information* section for additional application instructions. For aerial recommendations see Table 8.

Pardner (225 g/L), Torch (227 g/L), Torch DS (450 g/L) For seed production only. Controls several broadleaf weeds. See *Forage Crops Chart*. Apply 1.75 L/ha of Torch or 875 mL/ha of Torch DS in 100 L water or 1.25 to 1.5 L/ha of Pardner in 150 L water to bromegrass, crested wheatgrass, intermediate wheatgrass, slender wheatgrass, tall wheatgrass, meadow fescue, creeping red fescue, orchardgrass, reed canarygrass, Russian wild ryegrass and timothy. Apply when weeds are in the one to four leaf stage and seedling grasses are in the two to four leaf stage. Do not graze or harvest for forage in the year of treatment. May be applied to grasses alone or with a wheat, barley, oats, or flax cover crop.

Pardner may be tank mixed with 0.55 L/ha of 2,4-D or MCPA formulations containing 500 g/L. For product volumes of other 2,4-D or MCPA formulations, check Table 10.

Torch at 1.25 L/ha or Torch DS at 875 mL/ha may be tank mixed with Hoe-Grass for control of several grassy and broadleaf weeds in brome, crested wheatgrass, intermediate wheatgrass, Russian wild ryegrass or creeping red fescue only. Refer to Hoe-Grass recommendation and *Herbicide Information* section for specific application instructions.

Torch, Torch DS see Pardner

Weedar 80 (2,4-D amine) (500 g/L) Controls several broadleaf weeds. See *Forage Crops Chart*. Apply 0.55 to 1.10 L/ha in 100 L/ha water. Apply when grasses are in the three leaf to the shot blade stage. May be used on tame millet, but do not apply to Setaria species such as Siberian millet. Where wild mustard, lamb's-quarters, and spring seedlings of stinkweed or flixweed are the only problems use the 0.55 L/ha rate. May be applied to grasses alone or with a barley or wheat cover crop. MCPA and other brands of 2,4-D are not registered for use on seedling grasses.

Established legumes

Alfalfa

Preemergence

Kerb 50-W (50%) Controls foxtail barley. Apply 0.9 to 1.1 kg/ha product in 200 L water between October 1 and freeze-up. Use the lower rate on grey wooded soils. See the *Herbicide Information* section for application instructions.

Princep Nine-T (90%) Controls barnyard grass, green and yellow foxtail and several broadleaf weeds. See *Forage Crops Chart*. Apply 1.1 kg/ha product in 300 L water in fall (September to November, before freeze-up). This treatment will control susceptible plants as they germinate the following spring. Do not apply in the seedling year.

Sinbar (80%) Controls annual grassy and several broadleaf weeds. See *Forage Crops Chart*. Apply 0.7 to 1.5 kg/ha product in 200 L water after alfalfa goes dormant in fall or before new growth begins in spring. Fall application is preferable. Use the lower rate on light textured soils. Do not plant treated areas to any crop within two years as injury may result.

Postemergence

Asulox F (400 g/L) For seed production only. Controls wild oats, suppresses green and yellow foxtail, barnyard grass and several broadleaf weeds. See *Forage Crops Chart*. Apply 2.75 L/ha in 50 to 100 L water when wild oats are in the two to four leaf stage. Do not graze or harvest for livestock feed in the year of treatment.

Asulox F (400 g/L) plus Embutox E (400 g/L) For seed production only. Controls wild oats and several broadleaf weeds and suppresses green and yellow foxtail. See *Forage Crops Chart*. Apply 2.75 L/ha Asulox F tank mixed with Embutox E at 1.5 L/ha in 50 to 100 L water when wild oats are in the two to four leaf stage and before alfalfa reaches 15 cm in height. If alfalfa is under stress when sprayed, bloom may be delayed. Do not graze or harvest for livestock feed in the treatment year.

Carbyne 2EC (240 g/L) Controls wild oats. Apply Carbyne 2EC at 1.5 to 1.75 L/ha in 45 L water. Direct nozzles 45° forward and use a nozzle pressure of 300 kPa. Apply when the majority of wild oats are in the two leaf stage. Apply when the crop is dry. Refer to *Herbicide Information* section for application instructions.

2,4-D Controls several broadleaf weeds. See *Forage Crops Chart*. Apply 1.4 L/ha of formulations containing 500 g/L 2,4-D immediately after harvest. This treatment may cause some crop setback and should be used as a spot treatment only. For product volumes of other 2,4-D formulations, see Table 10.

Birdsfoot Trefoil

Preemergence

Kerb 50-W (50%) Controls foxtail barley. Apply 0.9 to 1.1 kg/ha product in 200 L water between October 1 and freeze-up. Use the lower rate on grey wooded soils. See the *Herbicide Information* section for application instructions.

Princep Nine-T (90%), Simadex (80%), Simadex Flowable (500 g/L) Controls barnyard grass, green and yellow foxtail and several broadleaf weeds. See *Forage Crops Chart*. Apply 1.1 kg/ha product Princep Nine-T or 1.5 kg/ha product Simadex 80W or 2.2 L/ha Simadex Flowable in 300 L water in fall (September to November, prior to freeze-up). It may also be used in the seedling year if the stand is well established; at least 50 plants/square metre and 15 cm tall.

Do not overlap or treat the same field with Princep Nine-T or Simadex for three consecutive years.

Clover

Alsike, red and sweet

Postemergence

Carbyne 2EC (240 g/L) Controls wild oats. Apply Carbyne 2EC at 1.5 to 1.75 L/ha in 45 L water. Direct nozzles 45° forward and use a nozzle pressure of 300 kPa. Application should be made when the majority of wild oats are in the two leaf stage. Apply when the crop is dry. Refer to the *Herbicide Information* section for application instructions.

Established grasses

Postemergence

Banvel (400 g/L) Apply to seed stands of creeping red fescue only. Controls several broadleaf weeds. See *Forage Crops Chart*. Apply 700 mL/ha in 110 L water. May be tank mixed with 2,4-D or MCPA amine. Apply up to the early shot blade stage. For dandelion control use Banvel plus 2,4-D amine in the fall when the weed

is in the rosette stage. If stand is to be used for seed production, use on **red fescue only**. The seed from treated grass should not be used for feed purposes.

Carbyne 2EC (240 g/L) Controls wild oats. Apply to **brome and Russian wild rye only**. Apply Carbyne 2EC at 1.5 to 1.75 L/ha in 45 L water. Direct nozzles 45° forward and use a nozzle pressure of 300 kPa. Apply when the majority of wild oats are in the two leaf stage and when the crop is dry. Refer to the *Herbicide Information* section for application instructions.

Kerb 50-W (50%) Controls foxtail barley. Apply 0.9 to 1.1 kg/ha product in 200 L water between October 1 and freeze-up. Use the lower rate on grey wooded soils. Do not apply to grasses for seed production or to desired stands of timothy or fescue grass species. See the *Herbicide Information* section for specific application instructions.

MCPA or 2,4-D Controls several broadleaf weeds. See *Forage Crops Chart*. Apply 1.25 to 2.25 L/ha of formulations containing 500 g/L 2,4-D or MCPA in 150 L water in early spring before the shot blade stage or after harvest. Where wild mustard, lamb's-quarters and spring seedlings of stinkweed or flixweed are the only problems, use 840 mL/ha. For product volumes of other 2,4-D or MCPA formulations refer to Table 10.

Pastures and roadsides

2,4-D and 2,4,5-T are not poisonous to livestock when used as directed. There is a one-day waiting period after the application of 2,4-D and a seven-day waiting period after application of 2,4,5-T or combinations containing 2,4,5-T before allowing livestock to graze on treated areas.

Certain poisonous plants become more palatable to livestock after being sprayed with 2,4-D or 2,4,5-T. As a result, poisonous plants which normally would be unpalatable, could be eaten following spraying. Information on common poisonous weeds is given in the Special Weed Problems section. In areas not suited to boom equipped ground sprayers, consider aerial spraying or ground sprayers equipped with a cluster nozzle.

Adequate spray volumes (at least 100 L/ha) for ground applications unless otherwise stated) are required to minimize drift and to ensure adequate spray coverage. For additional information on brush control see *Non Crop Weed Control* section.

Banvel (400 g/L) Controls absinthe, poverty weed, scentless chamomile, leafy spurge, pasture sage, biennial wormwood, prairie sage, prairie everlasting (pussy toes). Controls perennial thistles when applied before flowering in early July. Re-treat as necessary. Apply 1.5 L/ha in 110 L water. A tank mix of Banvel at 1.5 L/ha plus 2.2 L/ha of formulations containing 500 g/L 2,4-D may produce better results. For product volumes of other 2,4-D formulations, refer to Table 10. Do not graze dairy cattle for seven days after treatment with Banvel. Meat animals grazed on or fed treated forage within 28 days of Banvel application should not be slaughtered until a further 28 day period has elapsed. Do not apply Banvel or any Banvel tank mixes if the stand contains legumes.

Brushkiller 1:1 LV 600 (600 g/L), Brushkiller 2:1 LV 600 (600 g/L) Controls goldenrod. Apply at 3.5 L/ha in 200 L water in June. Do not apply Brushkillers if the stand contains legumes.

Cobutox (400 g/L), Embutox E (400 g/L), 2,4-D Butyric 400 (400 g/L) Controls several broadleaf weeds. See *Forage Crops Chart*. Apply 2.75 to 3.5 L/ha in 150 to 200 L water. Apply before pasture has 7.5 cm of new growth, in the spring or after cutting or grazing. Some height reduction may occur. Treatment will be less effective when applied during cool weather conditions.

To control narrow-leaved hawk's beard seedlings, apply 3.5 L/ha in 150 to 200 L water. Use in the fall after legume growth ceases.

Embutox E see Cobutox

Kerb 50-W (50%) Controls foxtail barley. Apply 0.9 to 1.1 kg/ha product in 200 L water between October 1 and freeze-up. Use the lower rate on grey-wooded soils. Do not apply to grasses for seed production or to desired stands of timothy or fescue grass species. See the *Herbicide Information* section for specific instructions.

Kil-mor (500 g/L) For use on roadsides only. Controls bull thistle, chicory, goat's-beard, white cockle and several other broadleaf weeds. Apply 3.5 L/ha in sufficient water for good coverage. For best results apply in the spring when plants are actively growing. Do not apply Kil-mor if the stand contains legumes.

Krenite (480 g/L) For use on roadsides only. Controls maple, oak, common alder, hazel, ash, elm, poplar, willow, birch, aspen, pine and balsam fir. Apply 10 to 15 L per 1000 L water. Add 1 to 2 L Surfactant WK, Tween 20 or Triton X-100 to the mixture. Apply at high pressure in 500 to 3000 L/ha of spray (volume depends on height, density and type of brush) and spray to wet. Apply from mid-June to late September. Results of this treatment are often delayed, so plants will remain green for most of the season after treatment. Susceptible plants will fail to leaf out the spring following treatment. This treatment is useful where immediate foliage browning is undesirable.

Tordon 22K (240 g/L) Controls perennial thistles and leafy spurge. To control perennial thistles apply at 4.5 L/ha in 400 L water from the rosette stage in the spring through flowering but before the first heavy frost in the fall. To control leafy spurge apply at 9 L/ha in 400 L water before the plants set seed.

NOTE: *Tordon 22K is registered for the control of biennial and deep-rooted perennial broadleaf weeds on rangeland and permanent grass pastures when applied under the direction of an authorized applicator. Directions for use and precautions must be followed*

carefully. Do not apply Tordon 22K if the stand contains legumes.

Tordon 101 Mixture (300 g/L) For use on roadsides only. Controls alder, birch, cedar, maple, pine, poplar, spruce, hazel, elm, willow, aspen, balsam fir. Apply 18 to 25 L/ha in 200 L water up to three weeks before the first killing frost. Controls Canada thistle, sweet and red clover, wild carrot, common ragweed, dandelion, goldenrod, dock, plantain, prickly lettuce, burdock, fleabane and vetch. Apply 7 L/ha in 200 L water in the spring or early summer after growth begins.

NOTE: *Applications of Tordon 101 Mixture must be made by authorized applicators. Do not apply Tordon 101 Mixtures if the stand contains legumes.*

2,4-D Controls absinthe, pasture sage, biennial wormwood, prairie sage, prairie everlasting (pussy toes) and leafy spurge. Apply 4.5 L/ha of formulations containing 500 g/L 2,4-D in 100 L water in early fall and repeat in spring when weed is growing in competition with grass. For product volumes of other 2,4-D formulations see Table 10. Re-treat as required. At least two treatments will be required during the season. 2,4-D also controls perennial thistles when applied before flowering in early June. Re-treat as necessary.

To control gumweed, goat's beard, cocklebur and common burdock, apply 2.25 L/ha of formulations containing 500 g/L 2,4-D in 100 L water in June or early July. For product volumes of other 2,4-D formulations see Table 10.

To control western snowberry (buckbrush), willows, wolf willow and scrub poplar, apply 4.5 to 9.0 L/ha of formulations containing 500 g/L 2,4-D in not less than 200 L water. Apply at full leaf stage when plants are actively growing, usually in June and early July. Retreatment may be necessary the following year. For product volumes of other 2,4-D formulations see Table 10.

2,4-D LV ester (aerial application) Controls western snowberry (buckbrush), willows, wolf willow and scrub poplar. Apply 4.5 to 9.0 L/ha of formulations containing 500 g/L 2,4-D in 30 to 60 L oil. Apply when plants are actively growing usually in June or early July. Treatment may be necessary the following year. For product volumes of other 2,4-D formulations, see Table 10.

2,4-D Butyric 400 see Cobutox

For total vegetation control along roadsides see the *Vegetation management* section. For spot treatment of special weed problems review the *Special Weed Problems* section.

Pasture renovation

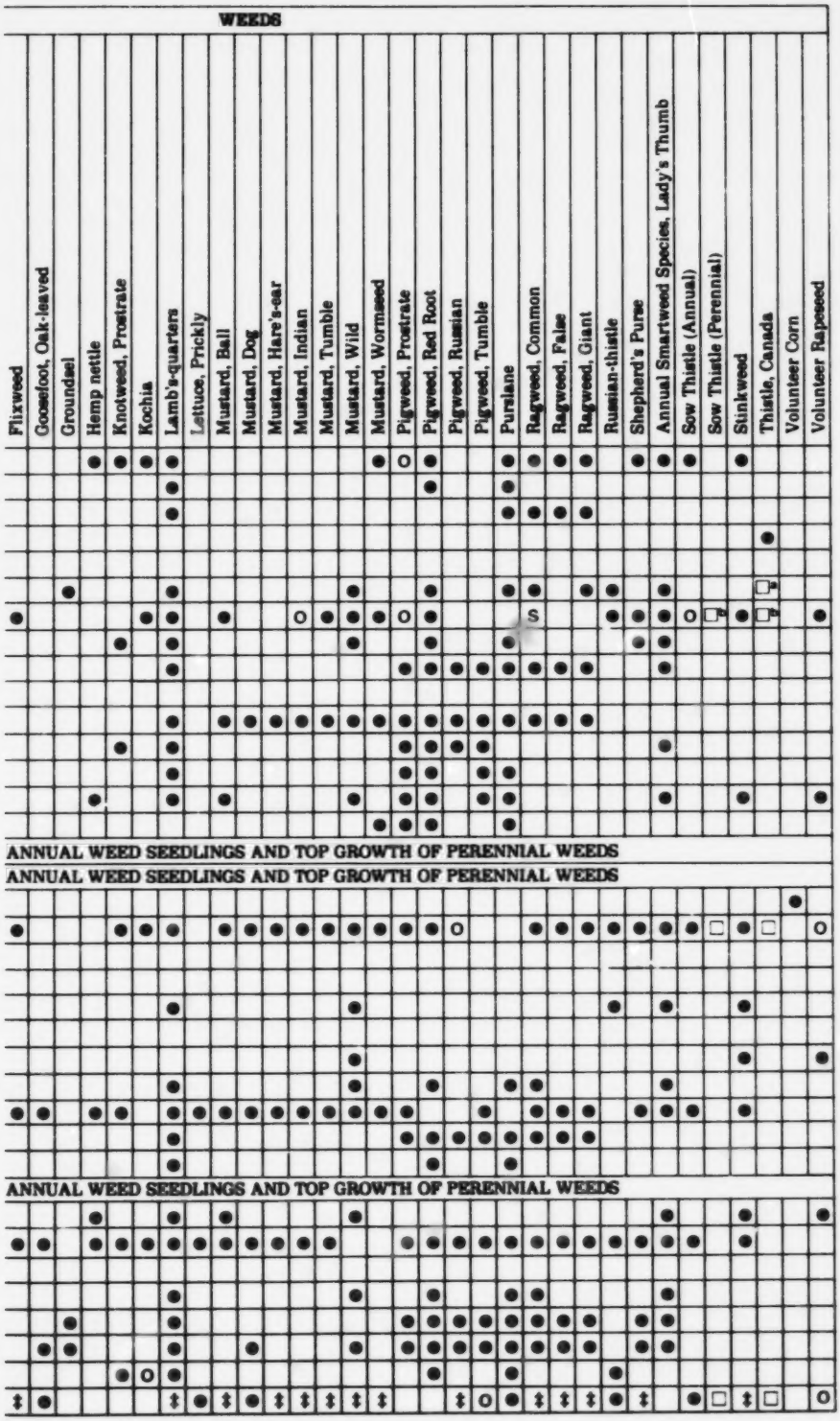
Certain products can be used to control or suppress existing vegetation for minimum tillage seeding of forages into established sod for renovating pastures.

Gramoxone (200 g/L) Controls annual broadleaf and grassy weeds. Apply 2.75 to 5.5 L/ha in 300 to 500 L water in May after 5 to 10 cm of new growth has appeared. To control perennial broadleaf weeds apply 2,4-D or a 2,4-D based treatment in August prior to Gramoxone treatment.

Roundup (356 g/L) Controls annual broadleaf and grassy weeds. Apply 2.25 to 3.5 L/ha in 100 to 300 L water. Use on existing vegetation immediately before, during or after zero-till seeding of forages into the established sod. See *Herbicide Information* section for specific application instructions. For control of perennial weed problems see the section on *Special Weed Problems.*

TABLE 7. HERBICIDES FOR HORTICULTURE CROPS

HERBICIDES \ CROPS	Asparagus	Beans, Lima	Beans, Snap	Beets	Broccoli, Brussel Sprouts	Cabbage, Cauliflower	Carrots	Celery	Corn, Sweet	Cucumbers	Onions	Parsnips	Peppers	Potatoes	Rutabagas	Tomatoes	Raspberries	Strawberries	Barnyard Grass	Foxtail, Green	Foxtail, Yellow	Wild Oats	Quack Grass	Bindweed, Field	Blue Bur	Buckwheat, Tartary	Buckwheat, Wild	Catchfly, Night Flowering	Chickweed	Cockle, Cow	Cocklebur
Afolan F Lorox L	X						X	X[1]				X[1]							●	S	S								●		
Agricultural Weedkiller No. 1							X					X							●	●	●	●									
Alanap 3 + Prefar										X									●	●	●			●					●		●
Amitrol T	X																						●								
Basfapon Dalapon Dowpon Dowpon M	X													X			X			●	●										
Basagran		X	X						X															●					●		●
Buctril M									X																●	●	●		●	●	●
Casoron 4G																	X			●	●								●		
CIPC + Randox											X								●	●	●								●		
Dual									X										●	●	●										
Dyanap										X									●	●	●										
Enide																		X	●	●	●										
Eptam			X											X	X				●	●	●	●	S						●		
Eptam + Sencor or Lexone														X					●	●	●	●	S			●			●		
Eradicane 8-E									X										●	●	●	●	S						●		
Gramoxone-stale seedbed		X	X	X	X	X	X		X	X	X			X	X																CONTROLS
Gramoxone-pre to crop	X													X			X[3]														CONTROLS
Hoe-Grass											X			X					●	●	●	●									
Kil-Mor									X														□	○	●	●	○			●	●
Lasso									X										●	●	●										
NaTA TCA				X																●	●										
Pardner, Torch, Torch DS									X																	●	●			●	
Prefar										X									●	●	●										
Premerge 360 Sinox PE Yellow Stuff PE		X[4]	X						X[4]					X[2]																	
Primextra[5]									X										●	●	●						●				
Princep Nine-T Simadex Simadex 80 W	X																X		●			●		●		●	●	●			
Randox											X								●	●	●										
Ro-Neet 7.2 E				X															●	●	●	●									
Roundup-pre to crop														X																	CONTROLS
Sencor, Lexone														X												●			●		
Sinbar																		X	●	●	●	●			●		●	●	●		
Sutan +									X										●	●	●										
Sutan + with Atrazine[5]									X										●	●	●	●					●				
Tenoran																		X											●		●
Totril											X																●		●		
Treflan EC		X	X		X	X	X						X		X	X			●	●	●	●					●		●	●	
2,4-D	X								X								X						□	●						●



LEGEND:

HERBICIDES AND CROPS

X Recommended on crop.

[1] Afolan only.

[2] Yellow Stuff PE only.

[3] Apply as directed spray.

[4] Premerge 360 Sinox PE only.

[5] These treatments may remain as a residue in the soil the following year. Flax, peas and fababeans are more tolerant crops. See comments in corn section for specific instructions.

LEGEND: WEEDS

● Controlled by maximum rates recommended for crops. Where two brand names are recommended, the weed may not appear on both labels.

S Suppression

O Not labelled for control but adequate control can be expected.

□ Top growth control only.

‡ Controlled by rates less than the maximum recommended for crops.

[a] Split application required for adequate control.

[b] Regrowth can be expected.

Vegetables

Stale seedbed

Crops

Beans (all types), beets, brussel sprouts, carrots, cabbage, cauliflower, corn, cucumber, kale, onion, peas, potatoes, rutabagas.

Method

Prepare seedbed two to four weeks before seeding to stimulate weed growth. Seed without further cultivation and with minimum disturbance of the soil. Emerged weeds must be burned off with Gramoxone either before or shortly after seeding, but no later than three days before the crop will emerge.

Gramoxone (200 g/L) Controls annual grasses and broadleaf weeds and top growth of perennial weeds. Apply 2.75 to 5.5 L/ha in 300 to 1100 L clean water preemergent to the crop, postemergent to the weeds. Use the higher rate when weeds are above 5 cm in height, and the higher volume of water on dense weed growth.

Asparagus

Established stands only.
Before spear emergence or after last cutting.

Afolan F (450 g/L), Lorox L (480 g/L) Controls barnyard grass, green and yellow foxtail and several broadleaf weeds. (Table 7) Apply Afolan F at 3.7 to 5 L/ha in 220 to 330 L water or Lorox L at 3.4 to 4.5 L/ha in 300 L water. Treatment may be repeated after last cutting.

Amitrol-T (200 g/L) Controls perennial grasses and thistles. (Table 7) Apply 22 L/ha in 200 to 500 L water after last cutting.

Basfapon (74%), Dalapon (74%), Dowpon (74%), Dowpon M (74%) Controls barnyard grass, green and yellow foxtail. Apply Basfapon or Dalapon at 3.25 to 6.75 kg/ha product in 200 L water or Dowpon or Dowpon M at 3.4 to 6.8 kg/ha product. Apply after cutting before grasses are at the four leaf stage.

To control quackgrass in established asparagus apply Dalapon, Dowpon or Dowpon M at 11 kg/ha product before cutting and again about three to four weeks later as needed. For a single treatment apply Dalapon at 22.5 kg/ha product or Dowpon or Dowpon M at 22 kg/ha product before or after the cutting season.

Apply Basfapon at 14.5 to 22.5 kg/ha product in 200 to 400 L water after cutting at one week before close of the cutting season, or in October after fern removal. Disc the field after last cutting. Do not make more than one application of Basfapon per season.

Dalapon see Basfapon

Dowpon, Dowpon M see Basfapon

Gramoxone (200 g/L) Controls annual grasses, broadleaf weeds and top growth of perennial weeds. Apply 2.75 to 5.5 L/ha in 300 to 1100 L clean water to emerged weeds. Use the higher rate when weeds are above 5 cm in height, and the higher volume of water on dense weed growth. Do not apply to emerged spears which are to be used for human consumption.

Lorox L see Afolan F

Princep Nine-T (90%), Simadex (500 g/L), Simadex 80 W (80%) Controls barnyard grass, wild oats and several broadleaf weeds. (Table 7) Apply Princep Nine-T at 2.5 to 3.75 kg/ha product in 300 L water, Simadex at 4.5 to 6.7 L/ha in 300 L water or Simadex 80 W at 2.75 to 4.25 kg/ha product in 350 L water after discing in spring prior to weed and spear emergence and at least seven days before first cutting. A second application may be made after harvest completion if weeds are removed. Do not apply during cutting season.

Simadex, Simadex 80 W see Princep Nine-T

2,4-D amine Controls perennial thistles. Apply 2.25 L/ha of formulations containing 500 g/L 2,4-D in 100 L water. Product volumes of other 2,4-D formulations are given in Table 10. Apply after last cutting.

Beans (Snap and Lima)

Stale seedbed

See the *Stale Seedbed Weed Control* at beginning of Horticulture Section.

Preplant incorporated

Eptam 8-E (800 g/L), Eptam 10G (10%) Snap beans only. Controls annual grasses and several broadleaf weeds. (Table 7) Spring application only. Apply 4.25 to 5.5 L/ha or 34 to 45 kg/ha product. Apply liquid in at least 100 L/ha water. The granular product should be applied with a suitable granular applicator. Eptam must be applied to a dry soil surface of a well prepared seedbed. Incorporate immediately according to instructions in *Herbicide Information* section.

Treflan EC (545 g/L) Controls green and yellow foxtail, wild oats and several broadleaf weeds (Table 7). For snap beans, apply 1.5 to 2.0 L/ha as a spring preplant application in at least 100 L/ha water. For lima beans, apply 1.0 to 1.5 L/ha. See the *Herbicide Information* section for application and incorporation instructions.

Preemergence

Premerge 360 (360 g/L), Sinox PE (360 g/L) Yellow Stuff PE (360 g/L) Controls several broadleaf weeds (Table 7). Apply Premerge 360 or Sinox PE at 17 to 22 L/ha in 250 to 400 L water at time of or shortly after planting. Apply Yellow Stuff PE on snap beans only,

at 14 L/ha in 400 to 500 L water. Do not apply these products on light sandy soil containing little or no organic matter.

CAUTION: *Use rubber gloves, goggles, and agricultural respirator when handling Premerge 360, Sinox PE or Yellow Stuff PE.*

Sinox PE see Premerge 360

Yellow Stuff PE see Premerge 360

Postemergence

Basagran (480 g/L) Controls several annual broadleaf weeds. (Table 7) Apply 1.75 to 2.25 L/ha in 200 to 400 L water after first trifoliolate leaf stage. The addition of Citowett Plus at 2.5 L/1000 L of spray mixture or Assist oil concentrate 5 to 10 L/1000 L of spray mixture will improve weed control.

Controls Canada thistle and field bindweed with split application of 1.75 L/ha plus 1.75 L/ha applied seven to ten days later in 200 to 400 L water. For Canada thistle control only, add Citowett Plus at 2.5 L/1000 L of spray mixture or Assist oil concentrate 5 to 10 L/1000 L of spray mixture when thistles are in the bud stage, 15 to 20 cm tall. Apply when field bindweed has developed a dark green colour and before it has begun trailing.

Premerge 360 (360 g/L), Sinox PE (360 g/L) Yellow Stuff PE (360 g/L) Controls several broadleaf weeds. (Table 7) Apply Premerge 360 and Sinox PE at 8 to 14 L/ha in 250 to 400 L water when beans are in, but not beyond the crook stage. Apply Yellow Stuff PE on snap beans only, at 8.5 L/ha in 400 to 500 L water. Do not use these products on light sandy soil containing little or no organic matter.

Apply when crop foliage is dry. Leaf burn may occur, but this is usually not harmful. Spraying is more effective and less product is required at moderately high temperatures of 21° to 30°C. However, to avoid crop damage, do not spray when temperatures exceed 30°C or is expected to exceed 30°C within 24 hours after application. Below 21°C use the higher rates. Since these products act by contact action only, ensure that the spraying system gives uniform coverage of all weed foliage.

CAUTION: *Use rubber gloves, goggles, and agricultural respirator when handling Premerge 360, Sinox PE or Yellow Stuff PE.*

Sinox PE see Premerge 360

Yellow Stuff PE see Premerge 360

Beets (Red)

Stale seedbed

See the *Stale Seedbed Weed Control* at the beginning of the Horticulture section.

Preplant incorporated

Ro-Neet 7.2 E (720 g/L) Controls annual grasses and several broadleaf weeds. (Table 7) Apply 4.75 to 6.25 L/ha in 200 to 400 L water. Immediately after application, thoroughly incorporate to a depth of 5 to 7 cm taking care to minimize loss of seedbed moisture.

Preemergence

NaTA TCA (85%) Controls green and yellow foxtail. Apply 6.16 to 9.86 kg/ha product in 100 L water before emergence. Do not feed tops to livestock.

Broccoli, Brussel Sprouts, Cabbage, Cauliflower
Direct seeded or transplant

Stale seedbed

See the *Stale Seedbed Weed Control* at the beginning of the Horticulture section.

Preplant incorporated

Treflan EC (545 g/L) Controls green and yellow foxtail, wild oats and several broadleaf weeds. (Table 7) Spring application only. Apply 1.5 to 2.0 L/ha in at least 100 L water. See the *Herbicide Information* section for specific application instructions.

Carrots

Stale seedbed

See the *Stale Seedbed Weed Control* at the beginning of the Horticulture section.

Preplant incorporated

Treflan EC (545 g/L) Controls green and yellow foxtail, wild oats and several broadleaf weeds. (Table 7) Spring application only. Apply 1.5 to 2.0 L/ha in at least 100 L water. See *Herbicide Information* section for incorporation instructions.

Postemergence

Afolan F (450 g/L), Lorox L (480 g/L) Controls barnyard grass, green and yellow foxtail and several broadleaf weeds. (Table 7) Apply Afolan F at 1.9 to 5 L/ha or Lorox L at 2.25 to 4.5 L/ha in 220 to 330 L water.

Do not apply with greater than 275 kPa pressure. Spray when carrots have two or more fully developed leaves. Use lower rates on small seedling weeds and higher rates on larger established weeds. Apply before annual grasses exceed 5 cm in height or before broadleaf weeds exceed 15 cm. During hot, dry weather spray in the cool part of the day to avoid injury.

Agricultural Weedkiller No. 1 (100%) Controls barnyard grass and several broadleaf weeds. (Table 7) Apply 600 to 800 L/ha as an overall treatment when carrots are in the two to four leaf stage and before weeds are 10 cm tall. Spray in evening when humidity is high and winds are light.

CAUTION: *Do not mix Agricultural Weedkiller No. 1 with other herbicides.*

1. *If Afolan F or Lorox L is applied first, wait 24 hours before applying Agricultural Weedkiller No. 1*
2. *If Agricultural Weedkiller No. 1 is applied first, wait at least two weeks before applying Afolan F or Lorox L.*

Lorox L see Afolan F

Celery

Postemergent to weeds, 8 to 10 days after transplanting and new growth has started.

Afolan F (450 g/L) Controls barnyard grass, green and yellow foxtail and several broadleaf weeds. (Table 7) Apply 1.9 to 5 L/ha in 220 to 330 L water. Do not apply under hot conditions.

Corn (sweet)

Stale seedbed

See *Stale Seedbed Weed Control* at the beginning of the Horticulture section.

Preplant incorporated

Dual (960 g/L) Controls green and yellow foxtail and barnyard grass. Apply 2 to 2.75 L/ha in a minimum of 150 L water. Use the higher rate for heavy weed infestations. Incorporate in the top 5 cm of soil with a tandem disc, vibrating shank cultivator or harrows set to work the soil no deeper than 10 cm. Immediate incorporation is not required. Do not use on peat or muck soils. Heavy rainfall conditions following application of Dual may result in reduced weed control, especially on sandier soil types. Dual may be tank mixed with Aatrex or Atrazine. See *Herbicide Information* section for incorporation instructions.

Eradicane 8-E (800 g/L) Controls several grasses and broadleaf weeds. (Table 7) Earlivee, Golden Beauty, Golden Jubilee, M-71112, M-71276, NK 51036, NK 199, North Star, Reliance (NK 2580), Span Cross, Sunnyvee and Yukon are tolerant varieties. Apply at 4.25 to 5.5 L/ha in at least 100 L water to the dry soil surface of a well prepared seedbed. Spray and incorporate immediately. Plant seed to a maximum depth of 5 cm. See *Herbicide Information* section for information on incorporation and rates required.

CAUTION: *The level of weed control may be reduced when Eradicane is used on soils which have been treated with Eradicane or Eptam the previous growing season. It is anticipated that the reduction in control will be greater where Eradicane or Eptam has been used repeatedly for two or more years.*

Lasso (480 g/L) Controls green and yellow foxtail. Apply 7.5 to 9.5 L/ha in a minimum of 150 L/ha of water. Incorporate in the top 5 cm of soil with a tandem disc working at 7.5 to 10 cm followed by a harrow. Do not use on peat or muck soils. Lasso may be tank mixed with Atrazine. For more information see the *Herbicide Information* section.

Primextra (500 g/L) Controls green and yellow foxtail, barnyard grass and several broadleaf weeds. (Table 7) Apply 6.7 to 8.5 L/ha in a minimum of 150 L water. Use the higher rate when heavy weed infestations are expected. Incorporate thoroughly into the top 5 cm of soil prior to planting. Immediate incorporation is not necessary. Heavy rainfall conditions following application of Primextra may result in reduced weed control, especially on sandier soil types. See *Herbicide Information* section for incorporation instructions. This treatment may leave a residue in the soil the following year. See caution under Sutan+ and Atrazine.

Sutan+ (800 g/L) Controls green and yellow foxtail and barnyard grass. Apply 4.25 to 5.5 L/ha in a minimum of 100 L water to a dry soil surface of a well prepared seedbed. Spray and incorporate immediately. Do not seed deeper than 5 cm. See *Herbicide Information* section for incorporation instructions. Follow Sutan+ application with a recommended postemergence herbicide to control broadleaf weeds if necessary.

Sutan+ (800 g/L) and Atrazine Controls barnyard grass, green and yellow foxtail, wild oats and several broadleaf weeds. (Table 7) Apply 4.25 to 5.5 L/ha Sutan+ with 2.4 to 3.5 L/ha liquid atrazine (500 g/L), or equivalent amounts of other formulations of atrazine. For product volumes of other atrazine formulations refer to Table 9. Apply in 100 to 500 L/ha water to a dry soil surface of a well prepared seedbed. Spray and incorporate immediately. Plant seed to a maximum depth of 5 cm. See *Herbicide Information* section for incorporation instructions.

CAUTION: *Atrazine or Primextra may remain as a residue in the soil the following year. Flax, peas and fababeans are more tolerant crops and should be considered to follow corn.*

Postemergence

For corn less than 15 cm tall (leaf outstretched) the following treatments may be applied as an overall spray.

Basagran (480 g/L) Controls several broadleaf weeds. (Table 7) Apply 1.75 to 2.25 L/ha in 200 to 400 L water. Use the lower rate to control lady's thumb and annual smartweed species 2.5 to 7.5 cm high, wild mustard 2.5 to 12.5 cm high, or cocklebur 7.5 to 17.5 cm high. Use the higher rate to control lady's thumb and annual

smartweed species 7.5 to 20 cm high, wild mustard 12.5 to 25 cm high, cocklebur 17.5 to 30 cm high, and seedlings of other susceptible weeds. The addition of Citowett Plus at 2.5 L/1000 L spray mixture or Assist oil concentrate 5 to 10 L/1000 L of spray mixture will improve the control of advanced weeds.

Basagran also controls top growth of Canada thistle and field bindweed (patch treatment). Apply a split application of 1.75 L/ha plus 1.75 L/ha seven to ten days later. Apply in 200 to 400 L/ha water, when thistles are in the bud stage, 15 to 20 cm tall and when field bindweed has developed a dark green color and before it has begun trailing. Add Citowett Plus at 2.5 L/1000 L spray mixture or Assist Oil concentrate 5 to 10 L/1000 L of spray mixture to improve control.

Best results are obtained when Basagran is applied under higher temperatures 21°C.

Buctril M (450 g/L) Controls several broadleaf weeds (Table 7). Apply 1.25 L/ha in 200 to 300 L water at a pressure of 275 kPa when corn is in the four to six leaf stage and weed seedlings are small. Leaf scorch may occur if application is made under hot, humid conditions.

Kil-mor (500 g/L) Controls several broadleaf weeds. (Table 7) Apply 0.85 to 1.1 L/ha in a minimum of 100 L water as an overall spray. For corn over 15 cm tall see directed postemergence recommendation in this section.

2,4-D amine Controls several broadleaf weeds. (Table 7) Apply 840 to 1120 mL/ha of formulations containing 500 g/L 2,4-D amine in 100 L water as an overall spray until corn is 15 cm tall (leaf outstretched), after which a directed spray should be used. See directed postemergence recommendations in this section. For product volumes of other formulations of 2,4-D amine see Table 10.

Yellow Stuff PE (360 g/L) Controls several weeds. (Table 7) Apply 8.5 L/ha in 400 to 500 L water after emergence from the spike stage until corn is 7.5 to 10 cm high. Severe burning will result if temperature is over 29°C or when corn has developed beyond the two leaf stage.

CAUTION: *Use rubber gloves, goggles and agricultural respirator when handling Yellow Stuff PE.*

For corn over 15 cm tall the following treatments may be applied as an overall spray.

Pardner (225 g/L) Controls several broadleaf weeds. (Table 7) Apply 1.25 to 1.5 L/ha in at least 200 L water. Apply when corn is in the four to eight leaf stage and before the weeds are past the four leaf stage. Do not use under conditions of high humidity and high temperature (greater than 30°C) or crop injury may occur.

Torch (237 g/L), Torch DS (450 g/L) Controls several broadleaf weeds. See Table 7. Apply 1.25 to 1.75 L/ha Torch or 625 to 875 mL/ha Torch DS in at least 159 L water. Apply before weeds are past the four leaf stage and before corn is 25 cm high. Do not apply under conditions of high humidity and high temperature (greater than 30°C) or crop injury may occur.

Directed postemergence

For corn over 15 cm tall (leaf outstretched). Application of these herbicides requires positioning of the nozzles to direct spray to the base of the corn plant. Severe damage is likely if the crop leaves are sprayed.

Kil-mor (500 g/L) Controls several broadleaf weeds. (Table 7) Apply 0.85 to 1.1 L/ha in a minimum of 100 L water.

2,4-D amine Controls several broadleaf weeds. (Table 7) Apply 1.7 L/ha of formulations containing 500 g/L 2,4-D amine in 100 to 200 L water according to the species and stage of weeds present. For product volumes of other formulations of 2,4-D amine, see Table 10.

Cucumbers

Stale seedbed

See the *Stale Seedbed Weed Control* at the beginning of the Horticulture section.

Preplant incorporated

Alanap 3 (240 g/L) plus Prefar (480 g/L) Controls barnyard grass, green and yellow foxtail and several broadleaf weeds. (Table 7) Apply 9.5 to 14 L/ha Prefar plus 9.5 to 19 L/ha Alanap 3. Apply as a tank mix in 100 to 400 L/ha water. Incorporate lightly 1 to 3 cm. Use lower rate on light sandy soils. See caution regarding residue under Prefar recommendation.

Prefar (480 g/L) Controls barnyard grass, green and yellow foxtail. Apply 12 to 14 L/ha in 100 to 500 L water. Incorporate 2.5 to 5 cm.

CAUTION: *Do not apply Prefar more often than once every 12 months. To avoid crop injury rotate only to cucumbers, peppers, cole crops, carrots, lettuce or tomatoes.*

Preemergence

Dyanap (330 g/L) Controls barnyard grass, green and yellow foxtail and several broadleaf weeds. (Table 7) Apply 14 to 17 L/ha in 200 to 400 L water. Thorough and uniform coverage of the surface is essential for good weed control. If soil is cold at time of seeding delay Dyanap application until soil temperature warms up. Do not apply after crop has emerged.

Onions

Stale seedbed

See *Stale Seedbed Weed Control* at the beginning of the Horticulture section.

Preemergence

CIPC (480 g/L) plus Randox (480 g/L) Controls barnyard grass, green and yellow foxtail and several broadleaf weeds. (Table 7) Apply 9.36 L/ha CIPC plus 9.5 L/ha Randox in 220 L water. Apply before weeds germinate and before onions have reached the loop stage. Rain or irrigation of at least 1.25 cm is required immediately after application for satisfactory results. Randox is recommended for use on soils high in organic matter or clay. It is less effective on sandy soils that are low in organic matter or clay.

NOTE: *Registration of Randox may not be continued for 1984. Consult Manitoba Agriculture regarding availability and permit requirements.*

Randox (480 g/L) Controls barnyard grass, green and yellow foxtail and broadleaf weeds. (Table 7) Apply 14 L/ha immediately after planting or if heavy rain is expected just before crop emergence.

On sets or transplant onions, apply 14 L/ha as a directed spray (overall sprays may cause tip burn during hot weather) soon after planting.

For a delayed or second application, apply 14 L/ha as a directed spray when the onions (except green onions) have developed three true leaves. Do not use within 45 days of harvest. Randox is recommended for use on soils high in organic matter or clay. It is less effective on sandy soils that are low in organic matter or clay.

NOTE: *Registration of Randox may not be continued for 1984. Consult Manitoba Agriculture regarding availability and permit requirements.*

Postemergence

Hoe-Grass (190 g/L) Dry bulb onion only. Controls wild oats, green and yellow foxtail, barnyard grass. Apply 5.25 L/ha in at least 110 L water at a nozzle pressure of 275 kPa. Direct nozzles 45° forward. Apply when the weeds are in the one to four leaf stage, and before they tiller. Other postemergence herbicides must be applied at least four days after Hoe-Grass application. Do not apply if rain is expected within one hour.

Totril (225 g/L) Controls several broadleaf weeds. (Table 7) Apply 2 L/ha in 400 L water. Apply when weeds are in the seedling stage and after the crop is in the three leaf stage. Applications may be repeated after 14 days for late emerging weeds.

Parsnips

Postemergence

Afolan F (450 g/L) Controls barnyard grass, green and yellow foxtail and several broadleaf weeds. (Table 7) Apply 1.9 to 5 L/ha in 220 to 330 L water. Do not apply with greater than 275 kPa. Spray when parsnips have two or more fully developed leaves. Use lower rates on small seedling weeds and the higher rates on larger established weeds. Apply before annual grasses exceed 5 cm in height and before broadleaves exceed 15 cm. During hot, dry weather spray in the cool part of the day to avoid injury.

Agricultural Weedkiller No. 1 (100%) Controls barnyard grass and several broadleaf weeds. (Table 7) Apply 600 to 800 L/ha as an overall treatment when crop is in the two to four leaf stage and before weeds are 10 cm tall. Spray in evening when humidity is high and the winds are light.

CAUTION: *Do not mix Agricultural Weedkiller No. 1 with other herbicides.*

1. *If Afolan F is applied, wait 24 hours before applying Agricultural Weedkiller No. 1.*
2. *If Agricultural Weedkiller No. 1 is applied first, wait at least two weeks before applying Afolan F.*

Peppers

Preplant incorporated

Treflan EC (545 g/L) Controls green and yellow foxtail, wild oats and several broadleaf weeds. (Table 7) Spring application only. Apply 1.5 to 2.0 L/ha in at least 100 L water. See *Herbicide Information* section for incorporation and rates required.

Potatoes

Timely tillage with harrows, mulchers and cultivators supplemented with chemical weed control can be used to effectively control most weeds in potatoes. Timing of operations and chemical control measures must be selected for specific field conditions and weed problems.

Stale seedbed

See *Stale Seedbed Weed Control* at the beginning of the Horticulture section.

Preplant incorporated

Eptam 8-E (800 g/L) Eptam 10 G (10%) Controls several annual grasses and broadleaf weeds. (Table 7)

Spring application

Apply 4.25 to 5.5 L/ha liquid or 34 to 45 kg/ha granular product. Apply liquid in at least 100 L/ha water. The granular product should be applied with a suitable granular applicator. Eptam must be applied to a dry soil surface of a well prepared seedbed. Incorporate immediately according to instructions in the *Herbicide Information* section.

Fall application

Apply 5.5 to 8.5 L/ha liquid or 45 to 67 kg/ha granular product in late fall prior to freeze-up. Apply liquid in at least 100 L water. Spray or broadcast on a dry soil

surface. Incorporate immediately according to instructions in *Herbicide Information* section.

Quack grass control

Spring or fall application. Apply 7 to 8.5 L/ha liquid or 56 to 67 kg/ha granular product. Apply liquid in at least 100 L/ha water. Spray or broadcast on a dry soil surface. Incorporate immediately according to instructions in *Herbicide Information* section. Quackgrass must be cut up so that remaining rhizomes have four or less nodes prior to application.

Eptam 8-E may be applied with liquid fertilizer, or on granular fertilizer. See the *Herbicide Information* section for specific instructions regarding application and use on dry fertilizer.

Eptam 8-E (800 g/L) plus Sencor 500 (500 g/L) or Sencor 75 DF (75%) Controls annual grasses and several broadleaf weeds. See Table 7. Apply a tank mix of 550 to 850 mL/ha Sencor 500 or 375 to 550 g/ha Sencor 75 DF plus 4.25 to 5.5 L/ha Eptam 8-E. Do not use on varieties Belleisle and Tobique or on soil with greater than 7 per cent organic matter. Refer to *Herbicide Information* section for incorporation instructions.

CAUTION: *Fall seeded cover crops such as wheat, oats and rye may be injured when seeded the same season as application of Lexone or Sencor. Rapeseed, sunflowers, sugar beets and several horticulture crops may be sensitive to Lexon or Sencor residue the year following application. After harvest tillage practices that provide thorough mixing of the soil may be helpful in reducing the chance of injury to succeeding crops.*

Eptam 8-E (800 g/L) plus Lexone DF (75%) or Lexone L (480 g/L) Controls annual grasses and several broadleaf weeds. (Table 7) Apply a tank mix of 550 to 850 mL/ha of Lexone L or 350 to 550 g/ha of Lexone DF plus 4.25 to 5.5 L/ha Eptam 8-E. Do not use on soils with greater than 7% organic matter or on sandy or coarse textured soils with less than 2% organic matter as crop injury may result. Do not use on red-skinned or early potatoes or on the varieties Belleisle or Tobique. Refer to Herbicide Information section for incorporation instructions.

CAUTION: *Fall seeded cover crops such as wheat, oats and rye may be injured when seeded the same season as application of Lexone or Sencor. Rapeseed, sunflowers, sugar beets and several horticulture crops may be sensitive to Lexone or Sencor residue the year following application. After harvest tillage practices that provide thorough mixing of the soil may be helpful in reducing the chance of injury to succeeding crops.*

Preemergence

Basfapon (74%), Dalapon (74%), Dowpon (74%), Dowpon M (74%) Controls barnyard grass, green and yellow foxtail. Apply Basfapon at 5.5 to 7.75 kg/ha product in 200 to 400 L water, Dalapon at 3.25 to 6.75 kg/ha product in at least 200 L/ha water, or Dowpon or Dowpon M at 3.4 to 6.8 kg/ha product in at least 225 L water. Do not apply after potatoes emerge and do not use on red skinned varieties.

To control barnyard grass, green and yellow foxtail and broadleaf weeds (Table 7), apply a combination spray of 8.5 to 11 L/ha of Premerge 360 and 3.25 kg/ha product of Dalapon in 250 to 400 L water, or 3.4 kg/ha product of Dowpon or Dowpon M in 275 to 450 L water.

Dalapon see Basfapon

Dowpon, Dowpon M see Basfapon

Eptam 8-E (800 g/L) - drag-off Controls several annual grasses and broadleaf weeds. (Table 7) Apply 4.25 to 8.5 L/ha. The field must first be "dragged-off", followed by Eptam 8-E application and incorporation. Use spike toothed harrows or cultivation equipment for incorporation. Refer to *Herbicide Information* section for further incorporation and rate instructions.

Gramoxone (200 g/L) Controls annual grasses, broadleaf weeds and top growth of perennial weeds. Apply 2.75 to 5.5 L/ha in 300 to 1100 L clean water to emerged weeds. Use the higher rate when weeds are above 5 cm in height and the higher volume of water on dense weed growth. Do not apply if more than 30 per cent of the potatoes have emerged. Do not apply to emerged plants in the evening, under cloudy conditions, or when plants are under moisture stress. Potatoes grown for early harvest should not be treated after emergence.

Roundup (356 g/L) Controls annual weeds. Apply 2.25 L/ha in at least 100 L water to actively growing grasses and broadleaf weeds less than 15 cm tall. If weeds are over 15 cm tall apply 3.5 L/ha. Apply to emerged weeds before or after planting, but before potatoes show above ground. Do not apply after potato emergence as Roundup will kill all green vegetation. Allow at least three days after treatment before disturbing the soil.

Controls perennial weeds. Refer to the Perennial Weed Control on Cropland section and the Special Weed Problems section for information on growth stages and rates of application. Also see *Herbicide Information* section.

Yellow Stuff PE (360 g/L) Controls several weeds. (Table 7) Apply 8.5 to 14 L/ha in 400 to 500 L water just before emergence when no more than 5 per cent of the plants have emerged. Use the higher rate if grasses are a serious problem. If a few plants have emerged, leaves may be burned by the treatment but will recover.

CAUTION: *Use rubber gloves, goggles and agricultural respirator when handling Yellow Stuff PE.*

Postemergence

Eptam 8-E (800 g/L) Sprinkler Irrigation Controls annual grasses and several broadleaf weeds. (Table 7) Meter 4.25 to 5.5 L/ha into first irrigation water following a clean cultivation. Do not apply within 45 days of harvest.

Hoe-Grass (190 g/L) Controls wild oats, green and yellow foxtail, barnyard grass. Apply 5.25 L/ha in at least 110 L water at a nozzle pressure of 275 kPa. Direct nozzles 45° forward. Apply when weeds are in the one to four leaf stage, and before they tiller. Other postemergent herbicides must be applied at least four days after Hoe-Grass application. Do not apply if rain is expected within one hour.

Lexone DF (75%) Lexone L (480 g/L) Controls several broadleaf weeds. See Table 7. Apply 550 mL/ha Lexone L or 350 g/ha Lexone DF in 100 to 300 L water. Apply early postemergence soon after potatoes emerge and before weeds are 4 cm high. Do not use on red-skinned, Shepody, or any early maturing varieties. Do not apply within 60 days of harvest.

Sencor 500 (500 g/L), Sencor 75 DF (75%) Controls several broadleaf weeds. See Table 7. Apply 550 mL/ha Sencor 500 or 375 g/ha Sencor 75 DF in 100 to 300 L water. Apply early postemergence soon after potatoes emerge and before weeds are 4 cm high. Do not use on the varieties Belleisle and Tobique. Do not use postemergence treatments on red skinned or on early maturing varieties. Do not apply within 60 days of harvest.

Rutabagas

Stale seedbed

See *Stale Seedbed Weed Control* at the beginning of the Horticulture section.

Preplant incorporated 6 to 10 days before planting.

Eptam 8-E (800 g/L), Eptam 10 G (10%) Controls annual grasses and several broadleaf weeds. (Table 7) Apply 3.25 to 4.25 L/ha or 22.5 to 34 kg/ha granular product. Apply liquid in at least 100 L water. The granular product should be applied using a suitable granular applicator. Eptam must be applied to a dry soil surface of a well prepared seedbed. See *Herbicide Information* section for information on incorporation.

CAUTION: *If dry weather prevails at the time of application, do not use Eptam on sand and use the lower rate on medium and heavy soils.*

Treflan EC (545 g/L) Controls green and yellow foxtail, wild oats and several broadleaf weeds. (Table 7) Spring application only. Apply 1.5 to 2 L/ha in at least 100 L water. Refer to *Herbicide Information* section for rate and incorporation instructions.

Tomatoes (transplanted)

Preplant incorporated

Treflan EC (545 g/L) Controls green and yellow foxtail and several broadleaf weeds. (Table 7) Spring application only. Apply 1.5 to 2 L/ha in at least 100 L water. See *Herbicide Information* section for rate and incorporation instructions.

Raspberries

NOTE: *The following treatments are recommended as directed sprays to established plantings only.*

Preemergent to weeds

Casoron 4G (4%) Controls annual and perennial grasses and broadleaf weeds. (Table 7) Apply 110 to 175 kg/ha product in the fall. Use the lower rate on lighter soils. Avoid use on light sandy soil. Use the lower rate if treatment is followed by rain or irrigation. Do not apply in spring as injury can occur. Do not cultivate or work into soil.

Princep Nine-T (90%), Simadex (500 g/L), Simadex 80 W (80%) Controls annual grasses and several broadleaf weeds. (Table 7) Apply 2 to 2.5 kg/ha product Princep Nine-T, 3.6 to 4.5 L/ha Simadex or 2.25 to 2.75 kg/ha product Simadex 80 W in 300 L water at base of canes in early spring. Do not spray young shoots. Avoid excessive wetting of raspberries.

Simadex, Simadex 80 W see Princep Nine-T

Postemergent to weeds

Basfapon (74%), Dalapon (74%), Dowpon (74%), Dowpon M (74%) Controls barnyard grass, green and yellow foxtail. Apply 3.25 kg/ha product of Basfapon or 1 to 3.25 kg/ha product of Dalapon, Dowpon or Dowpon M. Apply Dalapon in a minimum of 150 L/ha water. Apply Basfapon, Dowpon or Dowpon M in a minimum of 170 L/ha water. Apply Basfapon in fall only. Do not apply Dowpon or Dowpon M within 30 days of harvest. Avoid spraying raspberry foliage and young canes. Wet grass thoroughly.

Dalapon see Basfapon

Dowpon, Dowpon M see Basfapon

Gramoxone (200 g/L) Controls annual grasses, broadleaf weeds and top growth of perennial weeds. Apply 5.5 L/ha in 300 to 550 L water or 75 mL in 10 L water per 100 square metres. Direct spray near base of canes early in spring before new raspberry shoots emerge. Spray till leaves of weeds are wet. Do not spray past run-off.

2,4-D Controls several broadleaf weeds. (Table 7) Apply 1.4 L/ha of formulations containing 500 g/L 2,4-D amine in 100 to 225 L water. For product volumes of other 2,4-D formulations refer to Table 10. Application may be made at any time throughout the growing season when weeds are growing actively except when raspberries are in blossom. Care should be taken to keep the chemical off new shoots as much as possible.

Strawberries

Sinbar (80%) Controls annual grasses and broadleaf weeds. (Table 7)

New plantings

Apply 350 to 531 g/ha product. Apply after mother plants are well established but before new runner plants start to root (usually four to six weeks after planting)

After renovation on established stands

Apply 350 to 531 g/ha product after renovation and follow with application before mulching.

Before mulching in fall

Apply 700 to 1000 g/ha product in not less than 330 L water.

Use the lower of the recommended rates on sandy soil with low organic matter and on sensitive varieties such as Earlidawn, Midway, Bounty, Micmac and Sparkle. Temporary minor foliage injury may occur after application. *Use only on healthy, vigorous plants.* Weak, diseased or injured plants are subject to serious injury. Risk of strawberry plant injury is reduced if 1.5 to 3 cm of rain or irrigation follows immediately after application. Sinbar must be applied accurately within recommended application rates.

Growers using Sinbar for the first time, or growers changing production practices should treat only a limited area until experience is gained with Sinbar. Do not replant treated areas to any crop within two years after the last application as injury to subsequent crops may occur. To reduce replanting injury to subsequent crops, cultivate or plough soil thoroughly.

Postemergence

Enide (50%) Controls volunteer grains, barnyard grass and green and yellow foxtail. (Table 7) Apply 9 to 13.5 kg/ha product in at least 450 L water. Apply immediately before mulching in late fall. Enide does not leave a residue in the soil the following year. It may be considered to reduce restrictions on subsequent crops.

Tenoran (50%) Controls several broadleaf weeds. (Table 7) Apply 9 to 11 kg/ha product in 300 to 500 L water. Apply when weeds are less than 2.5 to 5 cm tall.

Irrigate immediately after application or apply just before or during a rain. Control should be effective for three to six weeks, after which Tenoran can be reapplied to newly emerged weeds. In the year of establishment, do not apply for four to five weeks after transplanting. In the bearing years, do not apply until after harvest.

Lawns

A sound management program on turf that provides vigorous growth of grass helps control weeds. Include fertilizing, watering and cutting at the proper height in the program. However, the application of herbicides may be required to obtain a weed-free lawn. Two herbicide applications are recommended for satisfactory control. The first, prior to May 31, controls susceptible species such as dandelions while the second using herbicide mixtures, controls the hard-to-kill weeds, such as chickweed, clover and creeping Charlie.

Take care in applying herbicides as annual flowering plants and many shrubs are susceptible. Precautions include: use of low-pressure or no-pressure applicators, application on non-windy days only, and the covering up of susceptible plants with newspapers. Remove newspapers shortly after spraying.

New lawns

Before establishing a lawn by either seeding or sodding, perennial weed problems such as Canada thistle, perennial sow-thistle and quackgrass must be brought under control. One or more flushes of annual weeds prior to seeding will reduce weed problems later. Precautions should be taken to prevent reinfestation through weeds setting seed, weedseed in lawn seed, and weeds in sod or topsoil.

Co-op Weedrite (5%), Weedrite (5%) Controls annual weeds and top growth of perennial weeds. Dissolve one sachet (57 g) in 10 L clean water and apply to 20 square metres with a watering can, dribble bar or sprayer. If weed growth is extremely dense, apply to 10 square metres. Spray to thoroughly wet foliage. This treatment will burn off top growth of all green vegetation. Repeated treatments may be required. After a minimum of three days roto till thoroughly and prepare a good seedbed. Seed or sod and top dress.

Roundup (356 g/L, 3.56 lb/gal) Controls quackgrass. Apply Roundup at 50 to 70 mL in 1.5 L water/100 square metres when quackgrass is at least 20 cm tall. See *Herbicide Information* section for specific application instructions. Wait at least five days before roto tilling to prepare the seedbed. Seed or sod and top dress.

2,4-D amine (200 g/L) Controls perennial thistles. Apply 75 mL in 10 L water/100 square metres. For products with other concentrations refer to label for rates.

New lawns can be sprayed after the first cutting with treatments recommended for established lawns unless otherwise stated. Timely mowing can be used to supplement chemical control.

Totril (225 g/L) Controls chickweed, ground ivy (creeping charlie), knotweed and clover. Mix 30 to 45 mL in 10 to 20 L water and apply to 100 square meters as soon as grass seedlings have reached a height of 2.5 cm. Can be used on fescue, bluegrass and bentgrass species. Some temporary tip scorch on grass may occur. Spray when weeds are growing actively. Do not spray in drought conditions.

Weedrite see Co-op Weedrite

Established lawns
Any time after first cutting

CAUTION: *Do not apply these herbicides to bent grass species except where specifically recommended.*

Co-op Lawn Weed Killer (200 g/L), Weed No-More (150 g/L) Controls perennial thistles, dandelions, plantain, mustard, stinkweed and lamb's-quarters. For best results spray dandelions before blooms appear in spring. Apply 75 mL Co-op Lawn Weed Killer in 10 L water/100 square metres. Use half the recommended rate on bent grasses. Apply Weed No-More at 120 mL in 20 L water/100 square metres. For control of dandelion and plantain apply Co-op Premiumn Spot Weed Killer (ready to use without mixing). Wet the weeds with one or two short bursts.

Co-op Premium Lawn Weed Killer (250 g/L), Killex (159 g/L) Controls black medick, chickweed, ground ivy (creeping Charlie), knotweed, common plantain, clover and other 2,4-D resistant weeds. Apply Co-op Premium Lawn Weed Killer at 100 mL in 10 L water/100 square metres of lawn area. Use Killex at 120 mL in 20 L water/100 square metres in spring or early fall when temperatures are above 10°C. Do not spray for several days after mowing, during hot spells or when rain is forecast. Killex should not be applied to newly seeded lawns until after the third mowing. For knotweed apply in May when plants are small. To treat ground ivy apply when growth begins and as often as necessary when regrowth appears. Co-op Premium Spot Weed Killer (ready to use), will give similar results. Do not use on bent grasses. Do not water within 24 hours after application

Killex see Co-op Premium Lawn Weed Killer

Super Compitox (200 g/L) Controls chickweed, ground ivy (creeping Charlie), knotweed, black medick, clover and other 2,4-D resistant weeds. Apply 125 mL in 10 to 20 L water/100 square metres.

Other formulations consisting of aerosols, fertilizer mixes and wax bars are available. These will give weed control if used as directed on the label but are no more effective than the above sprays. Be sure to use the

proper chemical, apply as directed on the label and take precautions to prevent drift. Use only amine formulations which are non volatile.

No selective herbicide is available to remove quackgrass in a blue grass lawn. Relatively good control of quackgrass may be obtained by the following maintenance procedures:

- Fertilize two or three times a year to produce a vigorous growth of lawn grass.
- Apply adequate water to promote good growth of the grass.
- Mow lawn twice a week at 4 to 5 cm height during the active period of growth. This will promote continual growth of the lawn grass but will stunt growth of the quackgrass.

For complete control of quackgrass it may be necessary to renovate. Follow recommendations in the section on establishing new lawns for information on quackgrass control.

Totril (225 g/L) + Compitox (150 g/L) Controls Veronica (speedwell), clover, plantain, and chickweed. Mix 30 mL Totril in 10 to 20 L of water, then mix in 90 mL Compitox and apply to 100 square meters of turf. Repeat application in 2 to 3 weeks using the same rate. Best control of speedwell is obtained by spraying in the spring before the plants have flowered. Do not spray in drought periods or in periods of prolonged cool wet weather. Do not mow the grass for three to four days before or after spraying. May be used on established bluegrass, bentgrass and fescues.

Weed No-More see Co-op Lawn Weed Killer

Shrubs, trees, flowers and ornamentals

Herbicides can be used to control annual weeds, reducing the amount of hand weeding required.

Hoe-No-More (4%), No-Hoe (4%) Controls barnyard grass, green and yellow foxtail, chickweed, lamb's-quarters, pigweed, purslane, ragweed and annual smartweed species. A 500 gram package of Hoe-No-More will treat 55 square metres and a 500 gram package of No-Hoe will treat 75 square metres. Refer to label for rates for specific situations. Apply to bare soil or after tilling or hoeing. Do not disturb treated soil. Avoid application to foliage of desirable plants and do not apply when foliage is wet.

Rainfall after application will improve control. If no rain falls within three to four days after application, water the area lightly to activate the herbicide. If water is not available very shallow cultivation may be necessary.

Weeds are controlled as they begin to grow. Control can be expected for six to eight weeks depending on weather conditions.

Co-op Garden Weed Preventer (1.47%) Controls barnyard grass, green and yellow foxtail, chickweed, knotweed, pigweed, lamb's-quarters and annual smartweed species. Apply 3 kg product/100 square metre or 30 g product/1 square metre before weeds emerge. Weeds already growing will not be controlled.

Soil to be treated should be loose and free of clods. Apply by shaking container over the area to be treated. Incorporate into the top 2 cm of soil by hand raking. Water lightly. For best results, apply in the spring. For annual flowers apply only after they become established (about two weeks after transplanting). Use only around ornamentals, shrubs and other established plants not used for food.

Co-op Weedrite (5%), Weedrite (5%) Controls top growth of all weeds. Dissolve one sachet (57 g) in 10 L clean water and apply to 20 square metres. If weed growth is extremely dense, double the rate of chemical and water. Can be used around ornamental shrubs and trees. Spray must not contact green bark or foliage. Re-treatment will be required for regrowth of perennial weeds or newly emerged weeds.

No-Hoe see Hoe-No-More

Weedrite see Co-op Weedrite

Vegetable gardens

Because of the wide variety of plants growing in a small area, herbicides have limited use in vegetable gardens. Large gardens can be treated according to recommendations for commercial vegetable production.

Discriminate use of 2,4-D amine, Weedrite and Co-op Weedrite will control weeds growing between rows. Extreme care must be taken to prevent drift onto desirable plants.

Quackgrass and perennial thistles can be controlled according to recommendations for lawn renovation. It may be necessary to leave the area out of production for at least part of the year.

Vegetation Burn-Off

Vegetation burn-off refers to the complete top growth control of all vegetation. This type of control is desirable along fence lines, driveways, and patios. Soil sterilants are not recommended for residential use.

Co-op Weedrite (5%), Weedrite (5%) Dissolve one sachet (57 g) in 10 L clean water and apply to 20 square metres. If weed growth is extremely dense, apply to 10 square metres. Spray must not contact green bark of trees or desirable vegetation. Re-treatment will be required for regrowth of perennial weeds or newly emerged weeds.

Weedrite see Co-op Weedrite

Unique weed problems

Many weed species are introduced as ornamentals and escape to create serious weed problems. Do not plant species which could create a weed problem.

Creeping bellflower, scentless chamomile, and kochia

Co-op Premium Lawn Weed Killer (250 g/L), Killex (159 g/L) Apply Co-op Premium Lawn Weed Killer at 100 mL in 10 L water/100 square metres of lawn area or Killex at 120 mL in 20 L water to 100 square metres. Spray to give thorough coverage. Apply in early spring or fall and repeat as necessary for regrowth. Good lawn management with frequent mowings will slowly starve the root system of creeping bellflower and will supplement chemical control. Well established plants can be dug out to improve control.

Killex see Co-op Premium Lawn Weed Killer

Cypress spurge, snow on the mountain

2,4-D amine (300 g/L) Apply 75 mL in 10 L water/100 square metres. For products with other concentrations refer to label for rates.

Foxtail barley

Co-op Weedrite (5%), Weedrite (5%) Will not give selective control in a lawn. Dissolve one sachet (57 g) in 10 L clean water and apply to 20 square metres. If weed growth is extremely dense, apply to 10 square metres. Re-treatment will be required for regrowth of foxtail barley and newly emerged seedlings. Foxtail barley is an indicator of poor drainage and salinity. Unless the soil problem is corrected reinfestation will occur.

Poison Ivy

Amitrol-T (300 g/L) Apply 375 mL in 25 L water. Thoroughly wet all foliage. Treat after leaves are fully developed in the spring until leaves start to turn colour in the fall. This treatment is not selective.

Roundup (356 g/L) Apply 75 to 125 mL/100 square metres when poison ivy has reached early bud stage. Allow seven or more days after application before tillage. This treatment is not selective.

Purslane (portulaca)

2,4-D amine (300 g/L) Apply 75 mL in 10 L water/100 square metres between rows in a garden. For products with other concentrations refer to label for rates. Do not allow the spray mixture to contact or drift onto desirable plants.

Red bartsia

2,4-D amine (300 g/L) Apply 75 mL in 10 L water/100 square metres. For products with other concentrations refer to label for rates. Treat during early growth, usually in early July. Re-treat if necessary.

Round-leaved mallow

2,4-D amine (300 g/L) Apply 75 mL in 10 L water/100 square metres. For products with other concentrations refer to label for rates. Apply during early stages of growth.

Scentless chamomile

See creeping bellflower recommendation.

Snow on the mountain

See cypress spurge recommendation.

Home ground herbicides

Herbicides recommended are available at most garden supply centres.

TRADE NAME	GENERIC NAME AND CONCENTRATION	
Amitrol-T	amitrole	200 g/L, liquid
Co-op Lawn Weed Killer	2,4-D	200 g/L, liquid
Co-op Garden Weed Preventer	trifluralin	1.47% granular
Co-op Premium Lawn Weed Killer	mecoprop + 2,4-D	250 g/L, liquid
Co-op Premium Spot Weed Killer	mecoprop + 2,4-D	6 g/L, ready to use liquid
Co-op Weedrite	paraquat + diquat	5% soluble granule
Hoe-No-More	chloramben	4% granular
Killex	mecoprop + 2,4-D + dicamba	150 g/L, liquid
No-Hoe	chloramben	4% granular
Roundup	glyphosate	356 g/L, liquid
Super Compitox	mecoprop + 2,4-D	200 g/L, liquid
Totril	ioxynil	225 g/L
Weed No-More	2,4-D	150 g/L, liquid
Weedrite	paraquat + diquat	5% soluble granule

Parks and Golf Courses

A sound management program on turf that promotes vigorous growth of grass helps to control weeds. Fertilizing, watering and cutting at the proper height should be included. The application of herbicides may be required to obtain weed-free turf. Two herbicide applications are recommended for satisfactory control. The first, prior to May 31, controls susceptible species such as dandelions and the second with a herbicide mixture controls the hard-to-kill weeds such as chickweed, clover, and creeping Charlie.

Care should be taken in the application of herbicides to prevent drift onto susceptible flowers, shrubs and trees. Precautions include the use of low-pressure or no-pressure applicators and application on non-windy days only.

Banvel (400 g/L) Controls clover, sheep sorrel, mouse-eared chickweed and erect knotweed. Apply 1.5 L/ha in 100 L water. A tank mix of Banvel at 1.5 L/ha plus 2,4-D amine at 1.1 to 2.2 L/ha of formulations containing 500 g/L 2,4-D is particularly effective against dandelion and plantain. For product volumes of other 2,4-D amine formulations, see Table 10. Do not apply to bent grass lawns. Do not apply closer than the drip line of trees and shrubs. Do not rake, mow or water lawn within 24 hours after application.

Betasan (480 g/L or 12.5% granular) Controls annual bluegrass. Apply 610 mL in 60 to 120 L water/200 square metres or 1.35 kg granular product/100 square metres. Can be used on bent grass species.

Compitox (150 g/L) Controls chickweed, ground ivy (creeping Charlie), knotweed, clover, black medick and other 2,4-D resistant weeds. Apply 11 L/ha in 300 to 400 L water. Can be used on bent grass species.

Compitox Plus (200 g/L) Controls chickweed, ground ivy, (creeping Charlie), knotweed, clover, black medick and other 2,4-D resistant weeds. Apply 8.4 L/ha in at least 200 L water.

Co-op Premium Turf Herbicide (350 g/L) Controls clover, chickweed, dandelions, plantain, knotweed, black medick, ground ivy (creeping Charlie). On established turf, apply 90 mL in 10 L water/100 square metres or 7.75 to 8.5 L/ha in 300 L water. Treat when weeds are growing actively and temperature is not over 30°C in late May or early June, or during late August or early September.

For an extensive infestation of ground ivy, treat in June and September for two seasons. For knotweed, apply in May or June. On bent grass, only apply as a spot treatment. Bent grass around the weed may be injured.

Killex (318 g/L) Controls chickweed, ground ivy (creeping Charlie), knotweed, clover, black medick and other 2,4-D resistant weeds. Apply 5.5 L/ha in at least 200 L water. Can be used on bent grass species at the rate of 30 mL in 20 L water applied to 100 square metres. Do not apply to newly seeded turf until after the second or third mowing. Do not water within 24 hours after application.

Mecoturf (150 g/L), Mecoturf Plus 2,4-D (400 g/L) Controls chickweed, ground ivy (creeping Charlie), knotweed, clover, black medick, and other 2,4-D resistant weeds. Apply 5.5 to 8.5 L/ha Mecoturf or 4.25 to 5.5 L/ha Mecoturf Plus 2,4-D in at least 200 L water. Mecoturf can be applied to bent grass species if temperature is below 27°C. Do not apply Mecoturf Plus 2,4-D to bent grass species.

Mecoturf Plus 2,4-D see Mecoturf

MCPA amine or MCPA mixtures of sodium and potassium salts or 2,4-D amine Controls dandelions, plantain and perennial thistles. Apply 3 L/ha of formulations containing 500 g/L MCPA or 2,4-D in 100 L water. For product volumes of various 2,4-D and MCPA formulations refer to Table 10. Do not apply 2,4-D on bent grass species.

Propaturf (700 g/L) Controls black medick, ground ivy (creeping Charlie), round-leaved mallow, stinkweed and other 2,4-D resistant weeds. Apply 3.5 L/ha in at least 200 L water. Do not apply to bent grass species.

2,4-D see MCPA

Totril (225 g/L) Controls chickweed, ground ivy (creeping charlie), knotweed and clover. Mix 30 to 45 mL in 10 to 20 L water and apply to 100 square meters as soon as grass seedlings have reached a height of 2.5 cm. Can be used on fescue, bluegrass and bentgrass species. Some temporary tip scorch on grass may occur. Spray when weeds are growing actively. Do not spray in drought conditions.

Totril (225 g/L) + Compitox (150 g/L) Controls Veronica (speedwell), clover, plantain, and chickweed. Mix 30 mL Totril in 10 to 20 L of water, then mix in 90 mL Compitox and apply to 100 square meters of turf. Repeat application in 2 to 3 weeks using the same rate. Best control of speedwell is obtained by spraying in the spring before the plants have flowered. Do not spray in drought periods or in periods of prolonged cool wet weather. Do not mow the grass for three to four days before or after spraying. May be used on established bluegrass, bentgrass and fescues.

Turf renovation

Roundup (356 g/L) Controls perennial grasses and broadleaf weeds. Apply 4.75 to 7 L/ha in 100 L water when broadleaf weeds are in the bud to bloom stage and when grassy weeds are at least 20 to 25 cm tall.

For specific application rates refer to the *Perennial Weed Control on Cropland* section or the *Special Weed Problems* section. Also check the *Herbicide Information* section for specific application instructions.

NOTE: ***All vegetation in the treated area will be destroyed.***

Aquatic weeds (agricultural)

Farm ponds and dugouts

Copper Sulphate (Bluestone) Controls algae. Apply 500 g of copper sulphate (bluestone) per 450,000 L of water. (Table A) Best control is achieved on a calm, hot day. This does not control all species of algae. Retreat as required to control reinvasion of algae. Copper sulphate will not spread by itself. Therefore, complete coverage of the dugout during application is essential. Swimming should not be allowed during and for a short period after treatment.

Table A — Weight of copper sulphate required to treat a 60 m X 20 m X 4 m dugout.

Approximate Water Depth m	Approximate Water Volume L	Weight Copper Sulphate kg
4.0	3,000,000	3.0
3.5	2,200,000	3.0
3.0	1,600,000	1.6
2.5	1,100,000	1.0

Karmex (80%) Control algae and aquatic weeds such as pondweed and chara. Use the lower rate for algae control and the higher rate for aquatic weeds and extended algae control. Use only in ponds with little or no water flow through.

For a dugout 21 m X 61 m X 1 m deep, apply 800 to 1600 g Karmex for algae control. For submergent aquatics apply 2.4 to 3.2 kg Karmex. For deeper water, increase rate proportionally.

Do not use in domestic water supply. Do not use treated water for irrigation within one year of treatment. Do not use if desirable trees or shrubs have roots extending to the water. If Karmex is to be used in farm ponds or dugouts a supplement to the label must be obtained as the required information is not on the label.

$$\text{Hectares - metres} = \frac{\text{width (m) X length (m) X average depth (m)}}{10{,}000}$$

Princep Nine-T (90%), Simmaprim (80%) Controls filamentous algae, submerged aquatics and chara. If filamentous algae is present, apply 5 g product of Princep Nine-T or 6 g product of Simmaprim to 10 000 L water. If submerged aquatics are present, apply 10 g product of Princep Nine-T or 12 g product of Simmaprim to 10 000 L water. For chara control, apply 20 g product of Princep Nine-T or 24 g product of Simmaprim, in 10 000 L water.

For a dugout 21m x 61m x 4m which contains 5 124 000 L when full, apply 2.6 kg product of Princep Nine-T or 3 kg product of Simmaprim to control filamentous algae. If submerged aquatics are present, apply 5 kg product of Princep Nine-T or 6 kg product of Simmaprim. For chara control, apply 10 kg product of Princep Nine-T or 12 kg product of Simmaprim.

Although Princep Nine-T or Simmaprim are low in toxicity to mammals, there is no residue tolerance established for it in fish. Therefore, fish taken from the treated ponds should not be used for human consumption.

NOTE: *Use Princep Nine-T or Simmaprim early in the season before dense growths of algae or submergent vegetation are present because of possible hazard to fish from oxygen depletion as the plants decompose and also for more effective control. Algicides are not effective for partial treatments in large ponds where there is a significant flow through at the time of treatment and for about 10 days. Treated water that contacts grass and other vegetation may cause damage. Avoid using where willow or valuable trees or shrubs are growing along the margins of the pond. Water treated with these products can be used for animal consumption. Do not use water for irrigation or human consumption for one year.*

Reglone A (200 g/L) Controls duckweed, coontail, Canada water weed, pondweed, water milfoil. Apply at 22 L/surface ha up to 1.5 m deep, or 30 to 35 L/surface ha over 1.5 m deep, early in season just after weeds begin active growth. Apply as overall spray. If duckweed is not present, application may be by injection. Avoid use of water for human and animal consumption for 24 hours after application. Do not use water for irrigation for five days after application. Repeat treatment if regrowth occurs.

For a dugout 21m x 61m, but less than 1.5m deep apply 2.82 L. If over 1.5m deep, apply 3.8 to 4.5 L.

Simmaprim see Princep Nine-T

Ditches

See Note A under non agricultural aquatic weed control.

Drainage ditches

Gramoxone S (200 g/L) plus Reglone A (200 g/L) Controls coontail, duckweed, Canada water weed, pond weeds and water milfoil. Apply 5.5 L/surface ha Gramoxone S plus 5.5 L/surface ha Reglone A to water no deeper than 0.75 m. For water deeper than 0.75 m, apply 11 L/surface ha Gramoxone S and 11 L/surface ha Reglone A. Consult label for directions on injection and timing.

Princep Nine-T (80%), Simmaprim (80%) Controls rooted aquatic weeds and most annuals. Apply 24 kg/ha product of Princep Nine-T or 28 kg/ha product of Simmaprim in 500 to 2000 L water. Apply to soil surface when area is dry. Discing after application assists in controlling deeply rooted weeds.

Reglone A plus Gramoxone S see Gramoxone S plus Reglone A

Simmaprim see Princep Nine-T

Irrigation and drainage ditches

Karmex (80%) Controls coontail, duckweed, Canada waterweed, pond weeds and water milfoil. Apply 23 to 67 kg/ha product in 300 L water. For irrigation ditches, apply during the non-crop season and when ditch is not in use. To minimize the movement of Karmex with irrigation water and avoid possible crop injury, the herbicide must be fixed in the soil by moisture.

Apply before expected seasonal rainfall (if possible, when soil in ditch is moist). Following treatment, if rainfall has not totalled at least 10 cm fill the ditch with water and allow to stand for 72 hours. Drain off waste water remaining before using ditch. Do not treat any ditch into which roots of trees or other desirable plants may extend as injury may result.

Surface floaters

MCPA amine, 2,4-D amine Controls waterlillies. Apply 9 L/ha of formulations containing 500 g/L 2,4-D or MCPA in 1100 L water. For product volumes of 2,4-D and MCPA formulations refer to Table 10. Thoroughly wet leaves.

2,4-D amine see MCPA amine

Emerged aquatics

Amitrol-T (200 g/L) Controls cattails. Use 45 to 55 L/ha in at least 1000 L water. Apply after cattails are fully formed and up to frost. Wet plants thoroughly. Do not allow spray to contact water which will be used for irrigation, drinking or other domestic purposes.

Basfapon (74%), Dowpon (74%) and Dowpon M (74%) Controls cattails and bulrushes. Apply 15 to 25 kg/ha product in 1000 L water. Spray when sprouts have emerged and are 60 to 90 cm tall. The addition of 2,4-D will control broadleaf weeds and woody plants. Do not use water in ditches treated with Basfapon, Dowpon and Dowpon M for irrigation until tested to be safe on the crops to be irrigated.

Dowpon, Dowpon M see Basfapon

Gramoxone S (200 g/L) Controls cattails and bulrushes. Apply 5.5 to 11 L/ha in 300 L water at the early flowering stage.

Roundup (356 g/L) Controls cattails. Apply 7 to 12 L/ha in 100 L water when cattails are in the mid to late flowering stage (mid July to mid August) and are actively growing.

2,4-D Controls cattails and bulrushes. Apply 9 L/ha of formulations containing 500 g/L 2,4-D in sufficient water to thoroughly wet the foliage. For product volumes of 2,4-D formulations refer to Table 10.

Aquatic weeds (non-agricultural)

NOTE A: *Any individual or organization intending to apply any herbicide to a body of water not totally contained within their own property must register with The Environmental Control Branch of the Department of the Environment and Workplace Safety and Health.*

Information about the area being treated, the weeds being controlled, the herbicides to be used, and other information on the use of the water should be supplied on the form provided by:

Environmental Management Branch

Box 7, Building 2, 139 Tuxedo Blvd.

Winnipeg, Manitoba

Lakes, ponds, canals, irrigation and drainage ditches

Copper Sulphate (Bluestone) Controls algae. Apply 500 g of copper sulphate (bluestone) per 450,000 L of water. (Table A) Best control is achieved on a calm, hot day. This does not control all species of algae. Retreat as required to control reinvasion of algae. Copper sulphate will not spread by itself. Therefore, complete coverage of the dugout during application is essential. Swimming should not be allowed during and for a short period after treatment.

Table A — Weight of copper sulphate required to treat a 60 m X 20 m X 4 m dugout.

Approximate Water Depth m	Approximate Water Volume L	Weight Copper Sulphate kg
4.0	3,000,000	3.0
3.5	2,200,000	3.0
3.0	1,600,000	1.6
2.5	1,100,000	1.0

Reglone A (200 g/L) Controls duckweed, coontail, Canada water weed, pondweeds and water milfoil. Apply 22 L/surface ha to water up to 1.5 m deep, or 30 to 35 L/surface ha to water over 1.5 m deep early in season just after weeds begin active growth. Apply as overall spray. If duckweed is not present, application may be by injection. Avoid use of water for human and animal consumption for 24 hours after application. Do not use water for irrigation for five days after application. Repeat treatment if regrowth occurs.

Drainage ditches, canals, urban ponds and beach areas

Gramoxone S (200 g/L) plus Reglone A (200 g/L) Controls coontail, duckweed, Canada water weed, pondweeds and water milfoil. Apply 5.5 L/surface ha Gramoxone S plus 5.5 L/surface ha Reglone A to water up to 0.75 m deep. For deeper water apply 11 L/surface ha Gramoxone S and 11 L/surface ha Reglone A. Check label for directions on injection and timing.

Princep Nine-T (90%), Simmaprim (80%) Controls rooted aquatic weeds and most annuals. Apply 24 kg/ha product of Princep Nine-T or 28 kg/ha product of Simmaprim in 500 to 2000 L water. Apply to soil surface when area is dry. Discing after application will assist in control of deeply rooted weeds.

CAUTION: *Do not apply where roots of desirable vegetation can extend into treated area.*

Reglone A plus Gramoxone S see Gramoxone S plus Reglone A

Simmaprim see Princep Nine-T

Surface floaters

MCPA amine, 2,4-D amine Controls waterlillies. Apply 9 L/ha of formulations containing 500 g/L 2,4-D or MCPA in 1100 L water. For product volumes of other 2,4-D and MCPA formulations refer to Table 10. Thoroughly wet leaves.

2,4-D amine see MCPA amine

Emerged aquatics

Basfapon (74%), Dowpon (74%) and Dowpon M (74%) Controls cattails and bulrushes. Apply 15 to 25 kg/ha product in 1000 L water. Spray when sprouts have emerged and are 60 to 90 cm tall. The addition of 2,4-D will control broadleaf weeds and woody plants. Do not use water in ditches treated with Basfapon, Dowpon and Dowpon M for irrigation until tested to be safe on the crops to be irrigated.

Dowpon, Dowpon M see Basfapon

Gramoxone S (200 g/L) Controls cattails and bulrushes. Apply 5.5 to 11 L/ha in 300 L water at the early flowering stage.

Roundup (356 g/L) Controls cattails. Apply 7 to 12 L/ha in 100 L water when cattails are in the mid to late flowering stage (mid July to mid August) and are actively growing.

2,4-D Controls cattails and bulrushes. Apply 9 L/ha of formulations containing 500 g/L 2,4-D in sufficient water to thoroughly wet the foliage. For product volumes of other 2,4-D formulations refer to Table 10.

Brush control

Several alternative herbicides are available for brush control. Applicators should be aware of the alternatives for each situation, and the limitations or concerns associated with each herbicide.

2,4,5-T has created public concern due to the presence of 2,3,7,8, TCDD (a form of dioxin). Tordon products are residual and may damage desirable vegetation if off-target movement occurs. Dicamba products restrict grazing after application. All brush control products can cause damage to adjacent vegetation if off-target drift occurs.

Select brush control herbicides only after considering suitability for brush to be controlled, restrictions on use of treated area, potential damage to adjacent areas, cost and public concern.

NOTE: *Use the higher rates when brush growth is over 2 m (6.6 feet) high. Treat at full leaf stage. Good spray coverage is essential. Re-treatment may be necessary the following year.*

Banvel (400 g/L), DyCleer (400 g/L) Controls western snowberry (buckbrush), wolf willow, trembling aspen, alder and wild rose. Tank mix 2.5 L Banvel or DyCleer with 4 L of formulations containing 500 g/L 2,4-D amine or LV ester in 1000 L water. Apply to the point of run-off in June when leaves are fully expanded. Cut brush and trees over 2 m and spray regrowth when it develops. For product volumes of other 2,4-D formulations see Table 10.

For balsam poplar, basswood, birch, elm, black cottonwood and bur oak apply a tank mix of 5 L DyCleer with 8 L of formulations containing 500 g/L 2,4-D amine or LV ester in 1000 L water. For product volumes of other 2,4-D formulations see Table 10. Apply to the point of run-off in June when leaves are fully expanded. Cut brush and trees over 2 m (6.6 feet) and spray regrowth when it develops.

To control spruce, pine, balsam fir, tamarack and white cedar apply a tank mix of 6.25 L DyCleer with 3.57 L Diphenoprop 700 or Silvaprop (700 g/L) in 1000 L water or 6.25 L DyCleer tank mixed with 8.35 L Brushkiller 1:1 LV 600 (600 g/L) in 1000 L water. Apply in June to coniferous and deciduous species when leaves are fully expanded. Apply to the point of run-off. Brush and trees over 2 m should be cut and regrowth sprayed when it develops.

Brushkiller 1:1 LV 600 (600 g/L), Brushkiller 2:1 LV 600 (600 g/L)

Susceptible species

Those which can be controlled with one thorough application at the proper timing include alder, birch, blueberry, caragana, cottonwood, currants, elderberry, grape, honeysuckle, Manitoba maple, rose, saskatoon, sumac, virginia creeper, willow.

Intermediate species

Those which require more than one application are aspen, poplar, balsam poplar, barberry, buckthorn, dogwood, elm and poison ivy.

Hard to kill species

Those which can be controlled by repeated applications (an additional basal treatment may be necessary) include ash, basswood, hawthorn, hornbeam, maple (red), oak, raspberry and western snowberry.

Foliar

To control susceptible and intermediate species foliar apply 0.5 L in 100 L water. Apply 0.65 L in 100 L water to control hard to kill species. For foliar application brush up to 2 m high should be sprayed when in full leaf and preferably before mid summer. Thoroughly spray all foliage, stems and trunks down to ground level. Trees and brush over 2 m should be cut and the regrowth foliage sprayed or the stumps treated.

Basal treatment

Apply 3 L in 100 L fuel oil to control susceptible and intermediate species. To control hard to kill species apply 5 L in 100 L fuel oil. Apply solution thoroughly to cause run-off on all sides of stems from ground line to 1 m high. Application can be made at any time of the year. This treatment is not effective for basswood and ash.

Stump treatment

Apply 3 L in 100 L fuel oil to stumps immediately after cutting by spraying or painting stumps, exposed roots and cut surface, to prevent regrowth.

Desormone 7 (700 g/L) Controls alder, aspen, birch, western snowberry (buckbrush), hazel, honeysuckle, poplar, sumac, elderberry, and willow. Apply 7 L in 1000 L water as a foliage spray after leaves are fully developed. During dry weather or late season spraying apply 10 L in 180 L diesel oil plus 810 L water. For early season application apply 7 to 10 L in 100 L diesel oil plus 890 L water.

Basal bark treatment

Apply 20 to 27 L in 1000 L oil to the base of the stem during any season. This mixture can also be applied to wet the remaining leaves and stems.

Stump or frill treatment

Apply 27 L in 1000 L oil to the stump, exposed bark and exposed roots of a cut tree, or apply to a continuous ring cut in the bark around the base of the tree. Stump treatment may be applied in any season but preferably as soon as possible after trees have been cut. Application can be made to freshly cut frill at any time of year, preferably to trees with a diameter greater than 13 cm.

DyCleer see Banvel

DyCleer 24 (600 g/L) Controls western snowberry (buckbrush), wolf willow, trembling aspen, alder, wild rose, cherry. Apply 5 L in 1000 L water.

To control balsam poplar, basswood, birch, elm, black cottonwood, bur oak, white spruce, pine, balsam fir, tamarack and white cedar, apply 10 L in 1000 L water. Apply chemical in June when leaves are fully expanded. Thoroughly wet foliage. Brush and trees over 2 m should be cut and regrowth sprayed when it develops.

DyCleer 10P(10%) Controls alder, aspen, balsam fir, birch, elm, pincherry, poplar, spruce, willow. Apply 50 to 70 kg/ha product.

To control cherry and mixed species of the above apply 70 to 85 kg/ha product. Apply in the spring or early summer to species up to 2 m when rainfall can be expected.

Gramoxone (200 g/L) Controls balsam fir, black spruce, cedar, red pine, Scots pine and tamarack. Apply 5.5 to 11 L/ha in 1000 L water to give a good spray coverage of the trees.

Krenite (480 g/L) Controls oak, maple, common alder, hazel, ash, elm, poplar, willow, birch, aspen, pine and balsam fir. Apply 10 to 15 L in 1000 L. Add 1 to 2 L surfactant to 1000 L mixture. Apply at high pressure in 500 to 3000 L/ha; the gallonage depends upon height, density and type of brush. Spray to wet. Apply from mid-June to late September.

Krenite activity is often delayed and plants will remain green for most of the season after treatment. Susceptible plants will fail to leaf out the spring following treatment. This treatment is useful where browning of foliage is undesirable.

NaTA TCA (85%) Controls conifers. Apply 9 to 11.3 kg product in 454 L water to give a good spray coverage of the trees. Spray during the growing season.

Silvaprop LV 700 1:1 Brushkiller (700 g/L) To control hawthorn, poplar, Scots pine, sugar maple, white cedar, wild cherry, wild plum and wild raspberry, foliar apply 7.5 L in 1000 L water.

To control alder, aspen, basswood, balsam fir, birch, bur oak, blueberry, elderberry, elm, ground juniper, hazel, honeysuckle, Manitoba maple, raspberry, red pine, rose (some regrowth), sumac, tamarack and willow, foliar apply 10 L in 1000 L water.

For best results apply on the foliage and stems just prior to or just after brush is in full leaf in the late spring or early summer. Many species may require retreatment the following year. Thoroughly wet down all foliage and stems to ground level. Apply 750 to 1500 L/ha of spray mixture depending on brush density and height.

Basal treatment

To control susceptible and intermediate species apply 2.8 L in 100 L fuel oil. Hard to kill species can be controlled by increasing the rate to 4.4 L in 100 L fuel oil. The solution can be applied to the basal part of the standing brush during anytime of the year. This treatment is not effective for basswood and ash. Apply thoroughly to cause runoff on all sides of stems from ground line to 1 m.

Stump treatment

Apply 2.8 L in 100 L fuel oil to tree stumps immediately after cutting by spraying or painting stumps, exposed roots and cut surface. Thorough drenching is essential.

Frill treatment

Apply 2.8 L in 100 L fuel oil. Cut frills with axe (downward) close together around the trunk without removing bark. Spray or paint exposed wood until run off. This method is recommended for resistant standing trees of more than 13 to 15 cm in diameter.

Roundup (356 g/L) Controls birch, poplar, raspberry, western snowberry (buckbrush) and willow. Apply 1 part/100 parts water to actively growing brush (June through August). Spray coverage must be uniform and complete for best results. Do not spray to runoff. Refer to the *Herbicide Information* section for application instructions.

Tordon 10K Pellets (10%) Controls coniferous and deciduous species. Apply at 70 kg/ha product. Use of this product is restricted to authorized applicators.

Tordon 101 (300 g/L) Controls coniferous and deciduous species. Apply at 4.5 L of product in 450 L water and drench foliage. Apply to woody plants 2 to 2.5 m tall up to three weeks before the first killing frost. Use of this product is restricted to authorized applicators.

2,4-D LV Ester Controls birch, honeysuckle, scrub poplar, western snowberry (buckbrush), willows, wolf willow and regenerated poplar. Apply 4 to 9 L/ha of formulations containing 500 g/L 2,4-D in not less than 225 L water, with ground equipment. Apply 4 to 9 L/ha of formulations containing 500 g/L 2,4-D in 33.7 to 67 L diesel oil for application by aircraft. For product volumes of other 2,4,-D formulations refer to Table 10. Apply between June 15 and July 15, before abscission layer is formed.

Dormant spraying

2,4-D LV Ester Controls birch, honeysuckle and poplar. Apply 4 L/ha of formulations containing 500 g/L 2,4-D in 33.7 L/ha diesel oil for application by aircraft. For product volumes of other 2,4-D formulations refer to Table 10. Applications of 2,4-D LV ester in a mixture of 33.7 L/ha diesel oil and 11 L/ha water have given good control when applied to poplar at bud stage. Caution is required to maintain the spray mixture by agitation and to prevent freezing of equipment. However, do not over agitate, as gel may form. This application does not give effective control of undergrowth or regenerated poplar. A foliar application is usually required two to three years after application of the dormant spray.

2,4-D LV Ester Controls birch, honeysuckle and poplar. Apply 4 to 9 L/ha of formulations containing 500 g/L 2,4-D in 112 to 169 L diesel oil applied with ground equipment. For product volumes of other 2,4-D formulations refer to Table 10.

Spot treatment

Hyvar XL (240 g/L) Controls alder, maple, aspen, ash, sumac, balsam poplar, oak, elm, basswood, hawthorn, willow, birch, spruce, dogwood, and pine. Apply in spring or summer, undiluted, using an exact delivery hand gun which delivers a thin stream of a measured volume when triggered. Apply one 8 ml deposit directed at the base of brush (root collar area) for plants up to 1 m high, two deposits on either side of plants up to 2 m, 3 deposits around a 3 m plant, and four to five deposits on taller brush. An extra deposit may be required to control ash. For larger areas requiring non-selective brush control, apply one 8 ml deposit on a 1 to 1.2 m grid.

Hyvar XL may also be applied diluted, 1 L Hyvar XL with 5 L water, using a back-pack or large volume equipment. Apply 55 ml per deposit rather than 8 ml as recommended above.

CAUTION: *Do not apply to brush in standing water. Water from treated ditches should not be used for irrigation. Do not apply in areas where desirable trees or shrubs are immediately adjacent to the treated area.*

Shelter belts

Deciduous or Coniferous Species as per label clearance.

Before planting

Preplant incorporated

Treflan EC (545 g/L) Tolerant species include American elm, caragana, green ash, Scots pine and Siberian elm. Controls barnyard grass, chickweed, cow cockle, green and yellow foxtail, kochia, lamb's-quarters, prostrate knotweed, purslane, red root pigweed, Russian thistle, volunteer oats, wild buckwheat, wild oats. Apply 4 L/ha on light sandy soils up to 6 per cent organic matter and 8.2 L/ha on medium and heavy soils with 6 to 15 per cent organic matter. Wild mustard may not be controlled at these rates.

Preplant - postemergence to weeds

Roundup (356 g/L) Controls absinthe, annual blue grass, annual sow-thistle, Canada blue grass, Canada thistle, cattail, common milkweed, common ragweed, curled dock, downy brome, field bindweed, green and yellow foxtail, hemp dogbane, hoary cress, Kentucky blue grass, knotweed, kochia, lady's-thumb, lamb's-quarters, prickly lettuce, mustard, poison ivy, quackgrass, red root pigweed, Russian thistle, shepherd's-purse, smooth brome grass, toadflax, wild buckwheat, wild oats, wild vetch. Apply 4.75 to 7 L/ha in 100 L water when the weeds are in the proper stage for control. Refer to the *Perennial Weed Control* on Cropland section and the *Special Weed Problems* section for details on application rates and timing. Also see the *Herbicide Information* section for specific application instructions.

After planting

New or established

Preemergence or early postemergence to weeds

Afolan F (450 g/L), Lorox L (480 g/L) Controls annual smartweed species, annual sow-thistle, barnyard grass, common chickweed, dandelion (seedlings only), goosefoot, green and yellow foxtail (suppression only), groundsel, hemp nettle, knotweed, kochia, lamb's-quarters, perennial sow-thistle (seedlings only), plantain (seedlings only), prostrate pigweed, purslane, ragweed, red root pigweed, shepherd's-purse, stinkweed, wild buckwheat, wild radish, wormseed mustard. Apply 5 to 10 L/ha Afolan F or 4.5 to 9 L/ha Lorox L in 400 to 550 L water. Do not apply with pressure greater than 275 kPa. Apply as an overall spray to dormant stock or as a directed spray if buds have broken. Apply before or immediately after weeds emerge but before they are 10 to 15 cm tall. Do not apply Afolan F until at least ten days after tree transplanting or Lorox L until trees have been established one year. Afolan F or Lorox L may be tank mixed with Gramoxone.

Lorox L see Afolan F

Postemergence to weeds

Afolan F (450 g/L) or Lorox L (480 g/L) plus Gramoxone (200 g/L) Controls grasses and broadleaf weeds. Apply 5.5 to 11 L/ha Gramoxone plus 5 to 10 L/ha of Afolan F or 4.5 to 9 L/ha Lorox L in 550 to 1100 L water directed to base of trees. Avoid contact with tree foliage.

CAUTION: *Do not use on small conifers without protection.*

Gramoxone (200 g/L) Controls annual grasses and broadleaf weeds and top growth of perennials. Apply 5.5 to 11 L/ha in 550 to 1100 L water when weeds and grass are 10 to 15 cm tall. Repeat application if regrowth occurs. Direct spray on the weeds and avoid contact with the tree foliage. Wet foliage thoroughly. For patch treatment use 75 mL in 10 L water/100 square metres.

CAUTION: *Do not use on small conifers without protection.*

Established more than one year

Preemergence to weeds

Casoron 4 G (4%) Controls several grasses and broadleaf weeds such as annual blue grass, annual smartweed species, chickweed, green and yellow foxtail, field horsetail, groundsel, knotweed, lamb's-quarters, pineappleweed, purslane, red root pigweed, shepherd's-purse, annual spurge, wild mustard. Apply 110 to 175 kg/ha product in fall or spring. Use the lower rate on lighter soils. Avoid using on light sand or gravel soils. Do not cultivate or work into the soil. Avoid applications when soil temperatures are high.

NOTE: ***Tolerant species include caragana, cutleaf weeping birch, crabapple, euonymus, juniper, and maple. Species not tolerant and which should be avoided include gladiolus, firs, hemlock, lilac, spruce and Mugho pine. For further information see manufacturer's label.***

Princep Nine-T (90%) Tolerant species include American elm, boxelder maple, caragana, green ash, Siberian elm. Controls annual smartweed species, annual sow-thistle, ball mustard, barnyard grass, bluebur, chickweed, common ragweed, dog mustard, false ragweed, flixweed, giant ragweed, hare's-ear mustard, hemp nettle, hoary alyssum, Indian mus-

tard, kochia, lady's-thumb, lamb's-quarters, night flowering catchfly, oak-leaved goosefoot, prostrate knotweed, prostrate pigweed, purslane, red root pigweed, Russian pigweed, shepherd's-purse, stinkweed, tumble mustard, tumble pigweed, volunteer clover, wild buckwheat, wild mustard, wild oats, wild radish, wormseed mustard. Apply 5 to 7.5 kg/ha product in 500 L water. Apply to trash free soil. Treatment should be made in the fall preferably, or in the early spring before the weeds emerge. Injury may occur to trees grown in saline soil.

Simadex (500 g/L), Simadex 80 W (80%) Tolerant species include caragana, green ash, Siberian elm, American elm and box elder maple. See Princep Nine-T for weeds controlled. Apply 9 to 13.5 L/ha Simadex or 5.5 to 8.5 kg/ha product Simadex 80 W in at least 500 L water to trash free soil. Irrigate following application if soil is dry. Treatment should be made in the fall preferably, or in the early spring before weeds emerge. Injury may occur to trees grown in saline soils.

Postemergence to weeds

Amitrol-T (200 g/L) Controls annual blue grass, barnyard grass, blue grasses, Canada thistle, chickweed, cocklebur, common burdock, common groundsel, dandelion, dock, field horsetail, foxtail barley, goldenrod, green and yellow foxtail, hemp nettle, hoary cress, lamb's-quarters, knotweed, kochia, milkweed, mustard, night-shade, night flowering catchfly, pigweed, plantain, poison ivy, purslane, ragweed, shepherd's-purse, smartweed, sow-thistle, toadflax, volunteer alfalfa, wild buckwheat, wild oats, witch grass, yellow rocket. Apply 22 to 35 L/ha in 500 L water. See the *Special Weed Problems* section for details on application rates and timing. Avoid contact with tree foliage, shoots or green bark. Apply to wet all weed foliage.

Roundup (356 g/L) Controls absinthe, annual blue grass, annual sow-thistle, Canada blue grass, Canada thistle, cattail, common milkweed, common ragweed, curled dock, downy brome, field bindweed, green and yellow foxtail, hemp dogbane, hoary cress, Kentucky blue grass, knotweed, kochia, lady's-thumb, lamb's-quarters, prickly lettuce, mustard, poison ivy, quackgrass, red root pigweed, Russian thistle, shepherd's-purse, smooth brome grass, toadflax, wild buckwheat, wild oats, wild vetch. Apply 4.75 to 7 L/ha in 100 L water when the weeds are in the proper stage for control. Apply only to shelterbelts containing caragana, elm, lilac, maple, mountain ash, poplar, Russian olive, willow, fir, juniper, pine, spruce or yew. Spray may contact mature bark only. Avoid contact with foliage, green bark or suckers. Spray coverage must be uniform and complete. Do not spray to runoff. Refer to *Perennial Weed Control on Cropland* section and the *Special Weed Problems* section for details on application rates and timing. Also see the *Herbicide Information* section for specific application instructions.

Soil fumigants

Soil fumigants can be used to destroy weed seeds in soil where weed free conditions are required. Cost restricts these applications to small, intensively managed areas. Care must be taken to prevent reinfestation with weeds.

Problems with the fumigant remaining active in the soil and injuring the planted crop may occur. Observe label precautions regarding temperature and waiting period.

NOTE: *Follow label safety precautions*

Basamid Granular (98%) Apply 3.25 to 5 kg product/100 square metres. Distribute evenly on the soil surface. This can be done by hand (with rubber gloves) or by means of a fertilizer spreader. Incorporate thoroughly and evenly into the soil to a depth of 15 to 23 cm immediately after application. After incorporation, irrigate to seal the Basamid Granular in the soil. Under normal weather conditions, a waiting period of three weeks before planting is necessary. If soil temperature averages below 16°C or if soil does not receive additional moisture during the three weeks after treatment, a longer waiting period may be necessary. Aerate the soil before seeding. Refer to the label for specific directions on use.

Dowfume MC2 *Plant beds* Apply 680 g/14 square metres. Expose for 24 hours. Aerate ten days before planting. Clovers and round-leaved mallow require a longer exposure time.

Apply using equipment listed on label. Treatment area must be sealed with polyethylene. Prepare soil for planting prior to treatment. Soil must be moist at time of treatment. Soil temperature at 10 cm should be 15°C. Between 10°C and 15°C, double exposure time. Do not apply if temperature is below 10°C. After aeration, till soil to speed further aeration.

Well rotted compost, manure, top soil

Apply 300 g/1 cubic metre. Exposure 24 hours. Aerate 72 hours, with thorough stirring after 24 hours. Refer to label for instructions on sealing pile and application.

Mulching straw or hay

Apply 680 g per 6 bales. Expose 48 hours. Aerate 24 hours. Soak thoroughly several days before treatment. Refer to label for instructions on sealing pile and application.

PRECAUTIONS

- Be sure treated material is free from Dowfume MC2 before seeding or planting.
- Soils high in organic matter (muck, compost, heavily manured soil) should be fumigated at least two months before planting.
- Carnations, conifers, multiflora roses, snap dragons and certain other ornamental plants and shrubs are sensitive to Dowfume MC2 residues. Use on a limited scale for at least a full season before extensive use.
- When ammonia-sensitive plants such as tomatoes are to be grown, apply nitrogen fertilizer as nitrate nitrogen, or delay planting several months after fumigation.
- Use only for turf renovation, seed and plant beds (flowers, shade and forest trees, ornamental shrubs and vines) and vegetables (for production of transplants only).
- Dowfume must be stored apart from lodging for humans, animal quarters and normal work areas.

Mylone (50%) Apply 6.5 kg product in 1000 L water/100 square metres. Spread evenly on the soil surface and add sufficient water to drench in Mylone and to form a water seal on the soil surface. Do not plant any crop for at least three weeks. If soil temperature is below 16°C, or if soil does not receive additional moisture after treatment, a longer waiting period is required.

Potting soil can be treated by applying Mylone to 15 cm layers of soil as a pile is made. Apply 4 kg/100 square metres. Refer to label for additional detail. Do not use soil for at least three weeks after treatment. If soil temperature is below 16°C, a longer waiting period is required.

Vapam (380 g/L) Apply 2 to 3 L in 160 L water to 19 square metres. Use higher rate on heavy soils. Apply as a coarse spray. Prepare soil by thorough cultivation one week before treatment. Keep soil moist. Apply only if air temperature is less than 32°C and winds are calm. Soil temperature must be 15 to 32°C at a depth of 8 cm. Water immediately after application until soil is wet to a depth of 8 to 10 cm. Best results will be obtained if area is covered with plastic for 48 to 72 hours after application.

On light or medium textured well drained soils, which are not wet or cold following application, planting may take place 21 days following treatment. On heavy or high organic matter soils, or soils which remain wet or cold (below 15°C) an interval of 30 days should be observed. At rates above 2 L/19 square metres wait at least 60 days. Frequent shallow cultivation may aid the escape of Vapam. If doubt exists, regarding residue of Vapam, transplant a few seedling plants and examine for injury before planting crop.

Vorlex (1185 g/L) Apply 225 to 450 L/ha for non-organic soils or 350 to 900 L/ha for organic soils, using injection type applicators. For improved weed control, apply Vorlex to a 10 cm depth and cover with a tarp for four days. Do not fumigate dry soils.

Fumigation period

After application at soil temperatures of 15°C or above, keep soil moist and undisturbed for a minimum of four days; seven days is preferable. Colder soils require a longer fumigation period.

Aeration period

Do not use soil when odour of fumigant is still detectable. For soil temperatures of 15°C or above and to a depth of 15 cm, aerate soil by cultivation after the fumigation period to aid aeration. For colder temperatures, extended rainfall and heavier soils refer to the product label for aeration directions. Follow label directions.

PRECAUTIONS:

- Do not add fertilizers containing ammonia salts or undecomposed manure to the soil at or near the time of fumigation.
- Use only fertilisers containing nitrates until soil temperature is above 18°C and crop is well established.
- Do not allow liquid or vapours to come in contact with lawn or desirable plants.
- Do not use in greenhouses which contain living plants.
- Avoid contamination of treated soil with untreated soil, transplants, or contaminated tools.
- Vorlex may be corrosive in certain conditions. Rinse all applicators and equipment with fuel oil or kerosene immediately after use. DO NOT USE WATER.
- Vorlex must be stored apart from lodgings for humans, animal quarters, food storage, and normal working areas.

Vegetation Management

Vegetation on storage areas, public works yards, parking lots, fence-lines, roadsides, drainage ditches, railway and hydro rights-of-way, create many problems for the owner. Weed control in these areas gives a well-kept appearance to the property. Herbicides to be considered for these types of weed problems include Contact Chemicals, Systematic Chemicals and Soil Sterilants.

Contact chemicals

Non-selective contact chemicals such as Gramoxone burn the sprayed foliage. Consider this chemical for vegetation control on slopes and on bottoms of drainage or road ditches, where roots are required for stabilization; in residential areas under fence-lines; around poles; in back-lane and parking areas, to ensure the safety of trees and shrubs.

Spray when weed or grass growth has reached a height of about 15 cm. Thorough coverage with the spray is essential as it destroys only the sprayed plant parts. Annual weeds are killed, but perennial weeds and grass will regrow and a second spraying may be required for satisfactory control. There is no residual effect from this chemical as it is inactivated by the clay particles of the soil.

Postemergence

Gramoxone (200 g/L) Controls annual grasses and broadleaf weeds and top growth of perennial weeds. Apply 11 L/ha or 75 mL in 10 L water/100 square metres.

Systemic chemicals

Selective

Where perennial broadleaved weeds exist it may be desirable to eliminate them and allow the grass to persist. Systemic chemicals such as 2,4-D, MCPA, Banvel mixtures and Tordon move throughout the plants when sprayed on the foliage. Thorough wetting of the foliage is essential for good control. For rates of these herbicides required to control specific weeds refer to appropriate sections of this publication.

Non-selective

Chemicals listed in this section must be applied to foliage of plants which are well established and actively growing so that movement into the root system takes place. This movement is necessary to control the root systems of perennial plants.

Do not cultivate prior to application. Suggested waiting periods after application for cultivation should be observed to allow sufficient time for movement in the plants to take place. This period should be extended during periods of cold or dry weather.

Do not allow spray drift to contact desirable vegetation as severe injury or destruction may occur.

Allisol (95%) Controls annual and perennial grasses and broadleaf weeds. Apply 4.25 kg/ha product in 1000 L water. Spray when most weeds are 15 to 25 cm tall. Follow manufacturer's directions carefully.

Amitrol-T (200 g/L) Controls annual and perennial grass and broadleaf weeds. Apply 22 to 35 L/ha in 1000 L water. Use the higher rate during periods of cool or dry weather. Follow manufacturer's directions carefully. Do not apply after October 1.

Roundup (356 g/L) Controls annual and perennial grass and broadleaf weeds. Apply 4.5 to 12 L/ha in 100 L water. Refer to label instructions for rates for specific weeds. There is no residual effect from this chemical. Spray coverage should be uniform and complete. Do not spray to the point of runoff. Refer to *Herbicide Information* section for specific application instruction.

Soil sterilants

The use of sterilants is recommended for complete vegetation control in industrial areas, hydro yards, storage areas, parking lots, along fence-lines, railroad balasts, drainage ditches, power poles and towers.

The movement of a sterilant downward and laterally will depend on the solubility of the compound and its absorption to soil particles. Soil sterilants move downward to a greater extent in light textured soils (sandy) than in heavy textured soils (clay) with high organic matter. The degree of movement also depends on the rate and amount of rainfall after application. Do not apply on slopes as surface movement may occur causing damage outside the treated area.

Avoid application near desirable trees (no closer than 1.5 times tree height) or other desirable vegetation as injury may occur. Avoid areas where roots of desirable plants may extend as chemical may be washed into contact with the roots causing injury. Do not remove treated soil until all chemical residue has disappeared.

Rainfall is required to move the chemical to the root zone where activity takes place. The length of the residual effect depends upon rainfall, soil type, and rate of application. In general, two to four years of vegetation control may be obtained at recommended rates.

Wettable powders

Eramox (80%) Apply 28 kg/ha product in at least 500 L water. For small areas mix 300 to 375 g product in 50 to 100 L water/100 square metres.

Hyvar X (80%) Apply 7.75 to 13.5 kg/ha product in at least 400 L water. For small areas, mix 135 g in 4.5 L/100 square metres.

Karmex (80%) Apply 14 to 27 kg/ha product on sands or sandy loams. On clays or high organic soils apply 40 to 55 kg/ha product. Use the lower rates where annual weeds predominate and one season's control is desired. Where perennial weeds predominate and where more than one season's control is required, use the higher rates.

Krovar I (80%) Apply 13.5 to 18 kg/ha product in at least 400 L water. For small areas, mix 180 g in 4.5 L/100 square metres.

Primatol 80 W (80%) Apply 28 kg/ha product in at least 500 L water. For small areas, mix 300 to 375 g product in 50 to 100 L (11 to 22 gal) water/100 square metres.

Simmaprim 80 W (80%) Apply 28 kg/ha product in at least 500 L water. For small areas, mix 300 to 375 g product in 50 to 100 L water/100 square metres. Simmaprim 80 W is fairly insoluble and requires continuous agitation during spraying.

Spike 80 W (80%) Apply 5.6 to 11.25 kg/ha product before or during periods of active plant growth. Initial control is enhanced by rainfall. Before spraying, calibrate equipment to determine quantity of water necessary to ensure uniform coverage. Continuous agitation is necessary to keep material in suspension.

Velpar (90%) Apply 2.75 to 9 kg/ha product in at least 1600 L water. Use postemergence when plants are growing actively. Use the low rate for contact kill and short term control.

Granules or pellets

Atra-pell (10%) To control annual vegetation and shallow rooted perennial weeds and grasses, apply 375 g/10 square metre. For control of deeper rooted perennial weeds and grasses apply 500 g/10 square metres.

Calmix Pellets (8%) Apply 5 kg product/100 square metres.

Co-op Granular Soil Sterilant, Co-op Total Vegetation Control (Granular) Apply 0.5 to 1 kg product in sufficient water to cover 10 square metres to control annual weeds or 1 to 2 kg/10 square metres to control perennial weeds. Apply when perennial weeds are nearing maturity or during dormant stage in fall. Apply in dry form or as a spray; uniform application is essential. If applying as a spray, 5 L solution/10 square metres is sufficient. Both spray and dry applications become effective as soil treatments following rainfall or irrigation.

Spike 5G (5%) Appiy 110 to 220 kg/ha product before or during the period of active growth of the plants to be controlled.

Flowable formulations

Primatol (500 g/L) Apply 45 L/ha in 200 L water. For small areas, apply 50 to 60 mL in 5 to 10 L water/100 square metres.

Liquid formulations

Amizine (159 g/L) Controls perennial grasses and broadleaf weeds. Apply 85 L/ha in a minimum of 500 L water in spring or early summer before weeds are 8 to 10 cm tall. Repeat every spring.

Hyvar XL (240 g/L) Apply 30 to 45 L/ha in sufficient water to obtain coverage. Use the high rate on soils greater than 5 per cent in organic matter. Repeat as required using 17 to 22 L/ha. For small areas, 450 mL will treat 100 square metres.

Special Weed Problems

This section identifies specific weeds and the herbicide use recommended to give control. Most of the recommendations are for use only on non-cropland. A few specific recommendations may be used on cropland. The crop has been indicated in each case but the user must refer to the particular crop section or the product label for further information on the correct crop stage for spraying and application instructions.

Recommendations for use in field, forage and horticultural crops can be found in the appropriate summary charts. See Tables 1 to 7, 15 and 16.

Baby's breath (perennial)

Banvel (400 g/L) DyCleer (400 g/L) Apply 11 L/ha in 100 to 200 L water when actively growing.

Black medick

Compitox (150 g/L) Apply 11 L/ha in 300 L water.

Bladder campion

Tordon 22 K (240 g/L) Apply 9.4 L/ha. See Note B.

There are no recommendations for selective control of bladder campion in field crops or forage legumes. See Manitoba Agriculture fact sheet *Bladder Campion — A Persistent Perennial* for additional information.

Canada thistle (on non-cropland)

For recommendations for Canada thistle on cropland see *Perennial Weed Control on Cropland* section.

Amitrol-T (200 g/L) Apply 22 to 35 L/ha in 500 L water applied at early flowering stage (patch treatment). Use the higher rate during periods of cool or dry weather. Allow three weeks after treatment before disturbing the root system. See Note A.

Banvel (400 g/L), Dycleer (400 g/L), DyCleer 24 (600 g/L) Apply 3 L/ha Banvel or DyCleer or 5.5 L/ha DyCleer 24 in 100 to 200 L/ha water. Apply when thistles are in the early bud stage. Allow three weeks after treatment before disturbing the root system.

Tordon 22 K (240 g/L) Apply 4.5 L/ha in 400 L water from rosette stage in the spring through flowering but before the first heavy frosts in the fall. See Note B.

Roundup (356 g/L) Apply 6 L/ha in 100 L water or 75 to 125 ml in 6.5 L water/100 square metres when most plants are in the bud to bloom stage. Do not disturb treated plants for at least 10 days following treatment. See *Herbicide Information* section for application information.

2,4-D amine Apply 4.5 L/ha of formulations containing 500 g/L 2,4-D applied at the early bud stage. Allow three weeks after treatment before disturbing the root system. For product volumes of other 2,4-D formulations refer to Table 10.

Creeping bellflower

Kil-mor (500 g/L) Apply 1.1 L/ha to suppress growth in the lawn.

Tordon 22 K (240 g/L) Apply 1.1 to 1.85 L/ha. Do not apply near trees. See Note B.

Curled dock

Banvel (400 g/L) DyCleer (400 g/L), DyCleer 24 (600 g/L) Apply 2.75 L/ha Banvel or DyCleer or 5.5 L/ha DyCleer 24 in 100 to 200 L water to actively growing weeds for top growth control.

MCPA amine, 2,4-D amine Apply 1.1 to 1.7 L/ha of formulations containing 500 g/L MCPA or 2,4-D amine to give top growth control. For product volumes of other MCPA and 2,4-D formulations refer to Table 10.

Roundup (356 g/L) Apply 7 to 12 L/ha in 100 L water when most plants have reached the early bud stage. Do not disturb treated plants for at least 10 days following treatment. See *Herbicide Information* section for additional information.

Cypress spurge

2,4-D amine Apply 4.5 L/ha of formulations containing 500 g/L 2,4-D amine, before the flowering stage. For product volumes of other 2,4-D formulations refer to Table 10.

Dandelions

Kil-mor (500 g/L) Apply 1.68 L/ha in 100 L water.

2,4-D amine Apply 4.5 L/ha of formulations containing 500 g/L 2,4-D amine, in 100 L water in early fall. Early spring treatment at this rate is also effective.

Dog mustard

2,4-D amine Apply 1.7 L/ha of formulations containing 500 g/L 2,4-D amine. May be used on wheat, barley or rye. Apply 2.25 L/ha of the same formulation after harvest to control fall growth. For product volumes of other 2,4-D formulations refer to Table 10.

Field bindweed

Banvel (400 g/L) DyCleer (400 g/L), DyCleer 24 (600 g/L) Apply 3 L/ha Banvel or DyCleer or 5.5 L/ha Dycleer 24 in 100 to 200 L water. Apply when field bindweed is in the flowering stage and allow three weeks after treatment before resuming normal summerfallow tillage.

Basagran (480 g/L) Apply 1.75 L/ha plus 1.75 L/ha seven to ten days later. Apply in 200 to 400 L/ha water before field bindweed has developed a dark green color and before it has begun trailing.

Embutox E (400 g/L) Cobutox (400 g/L), 2,4-D Butyric 400 (400 g/L) Apply 3.5 L/ha at the early flowering stage.

Roundup (356 g/L) Apply 7 to 12 L/ha in 100 L water at the bud stage. Do not disturb plants for at least 10 days following treatment. See *Herbicide Information* section for specific application instructions.

Tordon 22 K (240 g/L) Apply 9 L/ha. See Note B.

Tropotox Plus (400 g/L) Apply 4.25 L/ha at the early flowering stage.

2,4-D amine Apply 4.5 L/ha of formulations containing 500 g/L 2,4-D amine, at early flowering stage. For product volumes of other 2,4-D formulations refer to Table 10.

Field horsetail

Amitrol-T (200 g/L) Apply 22 to 35 L/ha in 500 L water (patch treatment). Use the higher rate during periods of cool or dry weather. Repeat as necessary. See Note A.

MCPA amine, potassium and sodium salt mixtures Apply 1.4 L/ha of formulations containing 500 g/L MCPA, after the weeds have fully emerged for top growth control. May be used in wheat, oats, barley, flax and rye. For product volumes of other MCPA formulations see Table 10.

Foxtail barley

Gramoxone (200 g/L) Apply 5.5 L/ha in 1100 L water or 75 mL in 10 L water/100 square metres for top growth control only.

Kerb 50-W (50%) Apply 0.9 to 1.1 kg/ha product in 200 L water between October 1 and freeze-up. Use the lower rate on grey-wooded soils or where perennial bluegrass or fescues are the predominant pasture species. Do not use Kerb 50-W for foxtail barley removal in seed grass stands or desired forage stands of Timothy or fescue grass species. See the *Herbicide Information* section for specific application instructions.

Roundup (356 g/L) Apply 4.75 L/ha in 100 L water. Apply in June to actively growing plants. Do not disturb treated plants for at least 10 days following treatment. See *Herbicide Information* section for specific application instructions.

Goldenrod

Banvel (400 g/L), DyCleer (400 g/L), DyCleer 24 (600 g/L) Apply 2.75 L/ha Banvel or DyCleer or 5.5 L/ha DyCleer 24 in 100 to 200 L when the weed is actively growing.

Goat's beard

Afolan F (450 g/L) plus MCPA Apply 470 to 620 mL/ha Afolan F and 1.1 L/ha of formulations containing 500 g/L MCPA amine when seedlings are in the one to four leaf stage. Use on wheat, barley and oats when the cereal crop is in the two to four leaf stage. Use 50 mesh or larger line strainers or screens. Use the lower rate of Afolan F when growing conditions and rainfall are above average. For product volumes of other MCPA formulations refer to Table 10.

2,4-D amine or LV ester Apply 2.24 L/ha of formulations containing 500 g/L 2,4-D as early as possible on the second year's growth or in early fall on the first year's growth. For product volumes of other 2,4-D formulations refer to Table 10.

Banvel (400 g/L), DyCleer (400 g/L) and DyCleer 24 (600 g/L) Apply 5.5 L/ha Banvel or DyCleer or use 11.0 L/ha DyCleer 24 in 100 to 200 L water when the weed is actively growing.

Hemp dogbane

Roundup (356 g/L) Apply 7 to 12 L/ha when hemp dogbane is in the early bud stage. Apply in 100 L/ha water. Do not disturb treated plants for at least 7 days after application. See *Herbicide Information* section for application information.

2,4-D amine of LV ester Apply 3.4 to 4.5 L/ha of formulations containing 500 g/L 2,4-D, in fall before frost and while plant leaves are green. For product volumes of other 2,4-D formulations refer to Table 10.

Leafy spurge

Amitrol-T (200 g/L) Apply 45 to 55 L/ha in 500 L water (patch treatment). Use the higher rate during periods of cool or dry weather. See Note A.

Banvel (400 g/L) DyCleer (400 g/L), DyCleer 24 (600 g/L) Apply 1.5 L/ha Banvel or DyCleer or 2.75 L/ha DyCleer 24 in 100 to 200 L water for top growth control when the weed is actively growing.

Tordon 22 K (240 g/L) Apply 9 L/ha. See Note B.

2,4-D amine Apply 4.5 L/ha of formulations containing 500 g/L 2,4-D at early flowering stage. Repeat at least once to new growth later in the season. Control of established plants and new seedlings will require continued applications for a period of at least four to five years. For product volumes of other 2,4-D formulations refer to Table 10.

Milkweed

Amitrol-T (200 g/L) Apply 22 to 35 L/ha in 500 L water. Apply before flowering (patch treatment). Use the higher rate during periods of cool or dry weather. See Note A.

Roundup (356 g/L) Apply 12 L/ha in 100 L water or 125 mL in 6.5 L water/100 square metres. Apply when most plants have reached the bud to bloom stage. Reduced results may occur on plants treated after full bloom. As not all milkweed plants reach the required stage of growth at the same time, repeat treatments may be required. Do not disturb plants for 10 days following treatment. Do not apply to plants covered with dirt. See *Herbicide Information* section for specific application instructions.

Moss

Copper Sulphate (bluestone) Apply 150 g product in 18 L water/100 square metres. This treatment is corrosive on metal. To control moss on a roof use Iron Sulphate at the same rate.

Nodding thistle

2,4-D amine Apply 2.25 L/ha of formulations containing 500 g/L 2,4-D amine in June and re-treat in September. For product volumes of other 2,4-D formulations refer to Table 10.

Poison ivy

Amitrol-T (200 g/L) Apply 11 L/ha in 500 L water. Apply after full leaf has developed but before coloring in the fall. See Note A.

Roundup (356 g/L) Apply 7 to 12 L/ha in 100 L water after full leaf has developed in spring. See *Herbicide Information* section for specific application instructions.

Other herbicides are registered for control of poison ivy but are not recommended as the above recommendations generally provide more consistent control.

Poverty weed

Banvel (400 g/L), DyCleer (400 g/L), DyCleer 24 (600 g/L) Apply 5.5 L/ha Banvel or DyCleer or 11 L/ha DyCleer 24 in 100 to 200 L water when weed is actively growing. Banvel at 1.5 L/ha or DyCleer 24 at 2.75 L/ha will provide only top growth control.

Embutox E (400 g/L) Cobutox (400 g/L), 2,4-D Butyric 400 (400 g/L) Apply 3.5 L/ha on barley and wheat, when the shoots of the weeds are 2.5 to 7.5 cm high. In a two year rotation of cereal and summerfallow, apply Embutox E to the weeds in the crop. Commence tillage immediately after harvest and continue whenever regrowth occurs throughout the summerfallow year. Repeat the rotation.

2,4-D LV ester Apply 4.5 L/ha of formulations containing 500 g/L 2,4-D to gradually reduce the stand of poverty weed. Spot treatments for at least five years may be required to reduce the stand to a point of eradication. For product volumes of other 2,4-D formulations see Table 10.

Red bartsia

2,4-D amine or LV ester Apply 1.4 L/ha of formulations containing 500 g/L 2,4-D in 100 L water. On hayland treat within 10 days after first cutting. Roadsides and pastures should be sprayed as soon as the red bartsia appears, usually in early July. Re-treat if necessary for later germination. For product volumes of other 2,4-D formulations refer to Table 10.

Round-leaved mallow

2,4-D, Brominal M, Bromox 450 M, Buctril M, Kilmor, Estaprop Apply at the highest rate recommended for crops tolerant to the herbicide used. Apply at the two to four leaf stage of weed growth.

Scentless chamomile

Brominal M (450 g/L), Bromox 450 M (450 g/L), Buctril M (450 g/L), Sabre (720 g/L) Apply Brominal M, Buctril M or Bromox 450 M at 1.25 L/ha or Sabre at 780 mL/ha at the two to six leaf stage of weed growth to control seedlings. May be used on wheat, oats, barley and flax. Control may not be as good in flax because of the lack of good crop competition to suppress further weed growth.

Banvel (400 g/L), DyCleer (400 g/L), DyCleer 24 (600 g/L) Apply 1.5 L/ha Banvel or DyCleer or 2.75 L/ha DyCleer 24 in 100 to 200 L water to actively growing weeds for top growth control.

Pardner (225 g/L), Torch (227 g/L), Torch DS (450 g/L) plus MCPA Apply 1.25 L/ha Pardner or Torch or 625 mL/ha Torch DS plus 560 mL/ha of formulations containing 500 g/L MCPA in 100 L water when the seedlings are at the two to six leaf stage of growth. For product volumes of other MCPA formulations refer to Table 10.

Tordon 22 K (240 g/L) Apply 1.1 L/ha to control established plants. See Note B.

Snow on the mountain

2,4-D amine Apply 2.25 L/ha of formulations containing 500 g/L 2,4-D amine in June and re-treat when necessary. For product volumes of other 2,4-D formulations refer to Table 10.

Sow-thistle (on non-cropland)

For recommendations for perennial sow thistle control on cropland see *Perennial Weed Control on Cropland* section.

Amitrol-T (200 g/L) Apply 22 to 35 L/ha in 500 L water at flowering stage (patch treatment). Use the higher rate during periods of cool or dry weather. Allow three weeks after treatment before disturbing the root system. See Note A.

Banvel (400 g/L) DyCleer (400 g/L), DyCleer 24 (600 g/L) Apply 3 L/ha Banvel or DyCleer or 5.5 L/ha DyCleer 24 in 100 to 200 L water when thistles are in the early bud stage. Allow three weeks after treatment before disturbing the root system.

Roundup (356 g/L) Apply 7 to 12 L/ha in 100 L water when most plants have reached early bud stage of growth. Allow seven or more days after application before disturbing the root system. See *Herbicide Information* section for further application instructions.

2,4-D amine Apply 4.5 L/ha of formulations containing 500 g/L 2,4-D amine at early bud stage. For product volumes for other 2,4-D formulations see Table 10. Allow three weeks after treatment before disturbing the root system.

Tordon 22 K (240 g/L) Apply 4.5 L/ha in 400 L water. See Note B.

Stinging nettle

2,4-D amine Apply 2.25 to 4.5 L/ha of formulations containing 500 g/L 2,4-D amine. For product volumes of other 2,4-D formulations see Table 10.

Stork's-bill

Estaprop (600 g/L) Apply 1.75 L/ha when weeds are at the two to four leaf stage. May be used on wheat or barley.

Tansy

Tordon 22 K (240 g/L) Apply 9 L/ha. See Note B.

Tansy ragwort

Banvel (400 g/L), DyCleer (400 g/L), DyCleer 24 (600 g/L) Apply 2.75 L/ha Banvel or DyCleer or 5.5 L/ha DyCleer 24 in 100 to 200 L water when weeds are actively growing.

2,4-D Apply 2.8 L/ha of formulations containing 500 g/L 2,4-D. For product volumes of other 2,4-D formulations refer to Table 10.

Toadflax

Amitrol-T (200 g/L) Apply 22 to 35 L/ha in 500 L water (patch treatment). Use the higher rate during periods of cool or dry weather. See Note A.

Roundup (356 g/L) Apply 7 to 12 L/ha when most plants have reached the early bud stage of growth. Allow seven or more days after application before tillage. See *Herbicide Information* section for specific application instructions.

Tordon 22 K (240 g/L) Apply 9 L/ha. See Note B.

2,4-D Apply 4.5 to 9 L/ha of formulations containing 500 g/L 2,4-D repeated annually to reduce infestation. For product volumes of other 2,4-D formulations refer to Table 10.

Vipers bugloss

Brominal M (450 g/L), Bromox 450 M (450 g/L), Buctril M (450 g/L), Sabre (720 g/L) Apply 1.25 L/ha Brominal M, Buctril M or Bromox 450 M or 780 mL/ha of Sabre. May be used on wheat, oats, barley or flax.

Swamp and water smartweed

Amitrol-T (200 g/L) Apply 11 to 23 L/ha in 500 L water. Use the higher rate during periods of cool or dry weather.

Banvel (400 g/L) Apply 3 L/ha in 560 L water.

White cockle

Banvel (400 g/L) plus MCPA amine or potassium salt or 2,4-D amine To control seedlings apply a tank mix of 350 mL/ha Banvel plus 840 mL/ha of formulations containing 500 g/L 2,4-D or MCPA. For product volumes of other MCPA and 2,4-D formulations refer to Table 10.

Mecoprop (150 g/L) Apply 5.5 L/ha in 225 L water for top growth control of "established plants". Will also control seedlings. For use in barley, oats, and wheat. Consult the product label for further information.

Yarrow

Is resistant to 2,4-D. Timely mowing will assist in starving the root system and prevent seed set.

NOTE:
(A) Amitrol-T This is a non-selective, systemic herbicide. Thoroughly wet the actively growing vegetation. Short term soil sterility will occur if excessive herbicide contacts the ground. Direct spray onto the weed to avoid excessive ground application.

(B) Tordon 22 K This is a systemic herbicide effective for control of broadleaf weed and tree species. It can be used to control biennials and deep-rooted perennials on rangeland, grass pastures, cropland and non-cropland. *It is recommended as a spot treatment only.* Tordon 22 K is extremely active, highly soluble in water with residues that persist in treated soil for several years. Follow directions carefully. It is only to be applied by authorized applicator.

Poisonous Weeds

Many well known plants contain poisonous substances that will cause death or severe reactions if ingested by humans or animals. House plants such as dumbcane *(Dieffenbachia sp.)* ornamental shrubs such as Oleander, garden plants such as the leaf of rhubarb, or beans of the castor bean, an ornamental plant are a few examples.

Some agronomic crops may become poisonous at certain stages of growth or when subjected to adverse growing conditions such as frost. Volunteer grain plants that are frozen can be quite toxic to livestock because of high levels of nitrate that accumulates in the frozen plant. The same effect can occur with annual weed species such as pigweed, lamb's-quarters and mustard.

Many poisonous plants are unpalatable to livestock in their natural state. However, they may become quite palatable when sprayed with a herbicide for control of the problem weed.

CAUTION: ***When poisonous plants are being sprayed, keep livestock away from the treated area for at least one week.***

Arrow grass

Eradication is impractical. Fence off large patches. 2,4-D has given good results in preliminary trials.

Death camus

2,4-D Apply 6.7 L/ha of formulations containing 500 g/L 2,4-D when plants are in early bud stage. Re-treat second and third year as necessary. For product volumes of other 2,4-D formulations refer to Table 10.

Locoweeds and milk vetches

2,4-D Apply 4.5 to 6.7 L/ha of formulations containing 500 g/L 2,4-D when plants are in full bloom stage. Re-treatment is necessary. For product volumes of other 2,4-D formulations see Table 10.

Water hemlock

2,4-D Apply 4.5 L/ha of formulations containing 500 g/L 2,4-D, from early growth to early bud stage. Thorough coverage is essential. Re-treatment may be necessary. For product volumes of other 2,4-D formulations see Table 10.

Western snowberry (buckbrush), Wolf willow

Banvel (400 g/L) or DyCleer (400 g/L), plus 2,4-D amine or LV ester, DyCleer 24 (600 g/L) Apply 2.5 L Banvel or DyCleer, tank mixed with 4.5 L/ha of formulations containing 500 g/L 2,4-D, or 5 L/ha DyCleer 24 in 1000 L water. For product volumes of other 2,4-D formulations refer to Table 10.

2,4-D Apply 4.5 L/ha of formulations containing 500 g/L 2,4-D, in not less than 225 L water with ground equipment. For product volumes of other 2,4-D formulations refer to Table 10.

2,4-D LV Ester Apply 4.5 L/ha of formulations containing 500 g/L 2,4-D, in 35 to 67 L diesel oil for application by aircraft. Treat at full leaf stage. Apply between June 15 to July 15 before abscission layer is formed. Good spray coverage is essential. Re-treatment may be necessary the following year. For product volumes of other 2,4-D formulations refer to Table 10.

Product amounts for smaller areas

Most recommendations are based on amount of product per hectare (or per acre). When applying a herbicide

to a small area, use the following conversion, unless otherwise specified in the recommendation.

For a 100 m² area

To convert from L/ha to mL/100 m², multiply by 10, or move decimal point one place to the right.

eg. 2.5 L/ha — use 25 mL per 100 m²

Another conversion is to use 10 mL/100 m² for every 1 L/ha recommended.

A spray volume of 5 to 10 L/100 m² is suitable for application using a hand sprayer. This is equivalent to 500 to 1000 L/ha.

Volunteer Crop Control

Volunteer crops must be considered as weed problems since they interfere with production of the intended crop, leading to reduced yields.

Good management practices, including proper combine adjustment and timely tillage will reduce the incidence of volunteer crop problems. Herbicides can be used to aid in the control of volunteer crops. Since herbicide availability is limited, crop rotation is an important factor to consider in a program of volunteer crop control.

Herbicides are generally not registered for volunteer crop control. Field experience has indicated that the following recommendations will usually give adequate control of the crops listed. At no time should a herbicide be applied to a crop to control a volunteer problem unless the use of the herbicide on the crop is registered for control of other weeds.

CAUTION: *Always adhere to registered use patterns relative to rate, stage and use restrictions. Anyone using these recommendations does so at their own risk.*

Buckwheat, tame

Brominal M, Bromox 450 M, Buctril M, Sabre, Pardner or Torch or Torch DS plus MCPA or 2,4-D Apply at rates recommended for use in cereal grains or flax. Apply at the two to four leaf stage of volunteer buckwheat.

Cereal grains, (wheat, barley, rye)

Asulox F Apply at rates recommended for use in flax or alfalfa when cereals are in the two to four leaf stage.

Eptam Apply as recommended for use in beans, flax, potatoes, sunflowers, sugar beets and alfalfa. Control of barley is not as consistent as other cereals.

Poast Apply as recommended for use in flax, rapeseed (Canola), soybeans or sugar beets for control of volunteer cereal grains in the one to six leaf stage.

Roundup (356 g/L) Apply 1.1 L/ha plus 350 mL of a non-ionic surfactant in 100 L water. Application should be made just prior to seeding, or after seeding but before crop emergence. Use clear water as reduced weed control may occur if water containing soil particles is used.

Cereal grains (tame oats)

Use wild oat herbicides as recommended.

Corn

Hoe-Grass Apply at rates recommended for use in cereal crops, other field crops or forages. Apply when corn is 15 to 25 cm high. Thorough coverage of all corn plants is required. Corn growing in clumps may be difficult to control.

Hoe-Grass II Apply at rates recommended for use in cereal crops and flax. Apply when corn is 15 to 25 cm high. Thorough coverage of all corn plants is required. Corn growing in clumps may be difficult to control.

Poast Apply at 0.8 to 1.0 L/ha for control of volunteer corn in flax, rapeseed (Canola), soybeans or sugar beets. Apply when corn is in the one to six leaf stage.

Flax (suppression only)

Banvel plus 2,4-D, Kil-mor Apply at rates recommended for use in cereal grains. Apply when flax is in the seedling stage.

2,4-D LV Ester Apply 1.7 L/ha of formulations containing 500 g/L 2,4-D as recommended for use in wheat, barley or rye. Apply when flax is in the seedling stage. For product volumes of other 2,4-D formulations refer to Table 10.

Mustard, rapeseed (including Canola)

Afolan F or Lorox L plus MCPA amine. Apply at rates recommended for use in cereal grains. Apply at the two to four leaf stage of mustard and rapeseed.

Banvel plus MCPA or 2,4-D, Kil-mor, DyVel Apply at rates recommended for use in cereal grains. Apply at the two to four leaf stage of mustard or rapeseed.

Brominal M, Bromox 450 M, Buctril M, Sabre, Pardner or Torch or Torch DS plus MCPA or 2,4-D Apply at rates recommended for use in cereal grains or flax. Apply at the two to four leaf stage of mustard or rapeseed.

Lexone, Sencor Apply at rates recommended for use in cereal crops. Apply at the two to four leaf stage of mustard or rapeseed.

MCPA amine, potassium and sodium salt mixtures or ester Apply 1.7 L/ha of formulations containing 500 g/L MCPA to cereal grains or flax. Apply when mustard or rapeseed is in the two to four leaf stage. For product volumes of other MCPA formulations refer to Table 10.

Stampede CM For control of rapeseed only, apply at rates recommended for use in cereal crops. Apply at the one to four leaf stage of mustard or rapeseed.

2,4-D amine or LV ester Apply 1.7 L/ha of formulations containing 500 g/L 2,4-D to wheat barley or rye. Apply when mustard or rapeseed is in the two to four leaf stage. For product volumes of other 2,4-D formulations see Table 10.

Sunflowers

Banvel plus MCPA or 2,4-D, Dyvel, Kil-mor Apply at rates recommended for use in cereal grains. Apply at the two to four leaf stage of sunflowers.

Brominal M, Bromox 450 M, Buctril M, Sabre, Pardner or Torch or Torch DS plus MCPA or 2,4-D Apply at rates recommended for use in cereal grains or flax. Apply at the two to four leaf stage of sunflowers.

Volunteer cereals, tame buckwheat, mustard, rapeseed

Atrazine Apply as recommended for use in corn. Several formulations are available.

Desiccation

Desiccation is the chemically accelerated drying of plants. It results in the destruction of all plant parts covered by the chemical. It facilitates the harvesting of plants that are cultivated for seeds, fruits, or tubers where the survival of leaves and stems after harvest is of no importance. Harvesting is made easier by the removal of unwanted foliage and weeds. Desiccation of a crop does not speed up maturity but will reduce the time from maturity to harvest.

Alfalfa, birdsfoot trefoil, red clover

Reglone (200 g/L) Apply 2.25 to 3.25 L/ha in 225 to 550 L water with ground equipment or 55 to 110 L/ha with aircraft. To prevent seed pods from shattering and subsequent loss of seed the interval between spraying and harvest should not exceed seven days. To improve the treatment effectiveness, Agral 90 should be added at the rate of 1 L/1000 L spray mixture.

Do not apply Reglone if a residual herbicide such as Princep Nine-T, Simadex, Simazine or Sinbar has been used on the legume stand within the previous 12 months.

NOTE: *There are no restrictions for feeding forage treated with Reglone to animals.*

Adzuki beans, dry beans (navy, white and red-kidney) and soybeans

Reglone (200 g/L) Apply 2.25 L/ha in at least 45 L water in light stands or fields free from weeds. In heavy stands or in fields which contain weeds apply 2.75 L/ha in at least 55 L water. Apply by means of a fixed wing aircraft fitted to apply a uniform spray coverage. Time the spray application to coincide with 80 to 90 per cent natural leaf defoliation of bean plants. Desiccation of weeds is completed in a week.

To provide more uniform coverage, add Agral 90 at a rate of 1 L/1000 L of spray mixture

Field peas

Reglone (200 g/L) Apply 2.25 L/ha in at least 45 L water in light stands or fields free from weeds. In heavy stands or in fields which contain weeds, apply 2.75 L/ha in 45 L water. Apply by means of a fixed winged aircraft fitted to apply uniform spray coverage. Spray when the crop has reached maturity. This treatment does not mature peas. Add Agral 90 at the rate of 1 L/1000 L spray mixture to provide for a more uniform coverage and complete desiccation.

Flax

Reglone (200 g/L) Apply 2.25 L/ha in at least 45 L water in light stands or in fields free from weeds. For heavy stands or fields which contain weeds, apply 2.75 L/ha in 45 L water. Apply with a fixed wing aircraft fitted to apply a uniform spray coverage. Spray when flax has fewer than 25 per cent green bolls (normal swathing time). Add Agral 90 at the rate of 1 L/1000 L spray mixture to provide for a more uniform coverage and complete desiccation.

Mustard

Reglone (200 g/L) Apply 2.25 L/ha in at least 45 L water in light stands or fields free from weeds. In heavy stands or in fields which contain weeds, apply 2.75 L/ha in 45 L water. Apply by means of a fixed winged aircraft fitted to apply uniform spray coverage. Spray when the crop is at the 55 to 75 per cent seed turn (green to brown) stage. Add Agral 90 at the rate of 1 L/1000 L spray mixture to provide for a more uniform coverage and complete desiccation.

Rapeseed (including Canola)

Reglone (200 g/L) Apply 2.25 L/ha in at least 45 L water in light stands or fields free from weeds. Apply 2.75 L/ha in 45 L water in heavy stands or in fields which contain weeds. Use a fixed winged aircraft fitted to apply uniform spray coverage. Spray when the crop is at the 60 to 75 per cent seed turn (green to brown) stage. Add Agral 90 at the rate of 1 L/1000 L spray mixture to provide for a more uniform coverage and complete desiccation. Do not direct combine Argentine varieties. Wait three days after spraying, then swath.

Sunflowers

Reglone (200 g/L) Apply 2.25 L/ha in 45 L water. Spray when the back of the heads turn yellow and the bracts have started to turn from green to yellow. Seed moisture should be less than 50 per cent. Apply by means of a fixed winged aircraft fitted to apply a uniform spray coverage. Add Agral 90 at the rate of 1 L/1000 L spray mixture to provide for more uniform coverage.

Potatoes

Dytop (300 g/L) Apply 7 to 9.75 L/ha in 800 to 1000 L water. Higher rate should be used if density of tops and weeds are heavy.

Potato Top Killer 300 (300 g/L) *For low volume sprays,* use 5 to 7 L/ha in 40 to 120 L water, apply by either air or ground equipment. *For medium volume spray,* use 5 to 8.5 L/ha in 200 to 350 L water depending on density of vine growth.

Adjust boom and nozzles to cover all parts of vines. Spray 10 to 20 days before harvest. The concentration of the spray and the amount of use per hectare are determined by the vigor of the vines, degree of kill desired and weather conditions at the time of application. Use the higher rates during cool, cloudy weather or where foliage growth is especially heavy.

CAUTION: *Use rubber gloves, goggles and agricultural respirator when handling Potato Top Killer.*

Reglone (200 g/L) *Ground application:* For heavy top growth or weedy field apply 4.25 L/ha. For light top growth and little weed growth apply 2.75 L/ha.

For mature top growth (little or no weed growth) apply 1.5 L/ha with Agral 90 added at the rate of 1 L/1000 L spray solution. Apply with a boom sprayer using at least 550 to 1100 L/ha water.

Aircraft application: Apply 2.25 to 2.75 L/ha in at least 45 L water followed by a second application 4 to 5 days later of 1.5 L/ha in at least 45 L water. Use a fixed winged aircraft fitted to apply uniform spray coverage.

Sinox General (600 g/L)

Low volume sprays

Use 3.5 to 4.25 L/ha in 45 to 90 L diesel or fuel oil applied by either air or ground equipment.

Medium volume sprays

Use 3.5 to 5 L/ha in 45 L fuel oil and 200 to 350 L water depending on density of vine growth. Adjust boom and nozzles to cover all parts of vines. Spray 10 to 20 days before harvest. The concentration of the spray and the amount of use per hectare are determined by the vigor of the vines, degree of kill desired, and weather conditions at the time of application. Use the higher rates during cool, cloudy weather or where foliage growth is especially heavy.

CAUTION: *Use rubber gloves, goggles and agricultural respirator when handling Sinox General.*

Topper (300 g/L) For light top growth and little weed growth apply at 5.5 to 8.5 L/ha to or for heavy top growth or weedy fields apply 8.5 to 9.75 L/ha in 1000 to 1200 L/ha water depending on the rate of kill desired. Split application five days apart at 2.75 L/ha for slow kill or 4.25 L/ha for fast kill may also be used. Do not apply later than 10 days before harvest.

CAUTION: *Use rubber gloves, goggles and agricultural respirator when handling Topper.*

NOTE: *Browning of the vascular ring of potato tubers sometimes occurs after the use of vine killers. Do not spray exposed tubers nor graze treated areas.*

Aerial Application

Application requirements and recommendations:

- Do not spray in winds above 15 km/h. Within ½ hour of sunrise or sunset, do not spray in winds above 10 km/h.
- Do not use nozzle pressures above 200 kPa except where specified for the product being applied.
- Avoid spraying when the relative humidity is below 40 per cent.
- Mount nozzles to direct spray horizontally towards the rear of the plane.
- To apply higher volumes use larger nozzles instead of adding more nozzles of the same size.
- Do not spray when the wind is blowing towards a nearby sensitive crop, garden or shelterbelt.
- Do not spray in a dead calm near sensitive plants.
- Except when applying Avadex BW granules, fly at a height of 1 to 2 metres from the wheels to the crop, or as low as conditions permit for safe operation.
- Shut off spray before pulling up over trees, powerlines or other obstructions. Make sure equipment is kept clean and that all nozzle shutoffs are working properly at all times.
- Use water as a carrier rather than oil, to avoid crop injury.

The herbicides included in Table 8 can be applied by air. For liquids a minimum water volume of 35 L/ha is recommended to reduce drift damage. For flax use a minimum water volume of 55 L/ha.

TABLE 8. AERIAL RECOMMENDATIONS FOR FIELD CROPS

	Cereals															
	Barley	Oats	Rye	Triticale	Wheat	Canary Seed	Faba beans	Flax	Forage Grasses	Forage Legumes	Lentils	Mustard	Peas	Rapeseed	Sugar beets	Sunflowers
Avadex BW Granular	X				X			X		X		X		X	X	
Avenge 200-C	X				X[c]	X			X	X						
Brominal M, Bromox 450 M, Sabre	X	X			X	X		X								
Hoe-Grass	X[b]				X			X								
Mataven				X	X[d]	X			X	X						X
MCPA amine (including Aeromin), MCPAK	X	X	X[a]		X			X								
Poast								X						X	X	
2,4-D amine (including Aeromin)	X		X		X				X[e]							

[a] MCPA amine only
[b] Do not use Hoe-Grass on Norbert, Klages, Betzes or Glenn barley
[c] Avenge 200-C may be used on Glenlea, Neepawa, Selkirk, Chester, Macoun, Canuck and Benito wheat only
[d] Do not use Mataven on Selkirk wheat
[e] Use WEEDAR 80 (2,4-D amine) only

CAUTION: ***Take all possible precautions to prevent drift damage to susceptible crops, shelterbelts, gardens and yard areas.***

Liquids

Avenge 200-C (200 g/L) Controls wild oats. For barley, canary seed and wheat (Glenlea, Neepawa, Selkirk, Chester, Macoun, Canuck, Benito only) and the following seedling forages when underseeded to wheat or barley — alfalfa, birdsfoot trefoil, red and sweet clover, creeping red fescue, meadow fescue, bromegrass, timothy, crested wheatgrass, orchardgrass, Russian wild ryegrass, reed canarygrass and Kentucky bluegrass, apply 3.5 to 4.25 L/ha in 20 to 50 L/ha water. Use the higher rate when there are more than 200 wild oat plants/square metre.

Apply when wild oats are in the three to five leaf stage. Do not apply when wind exceeds 15 km/h. Make application as close to the growing crop as possible. For tank mixing with broadleaf herbicides, choose only those products registered for aerial application and refer to the label of the broadleaf herbicide. Do not graze or feed treated cereal crops to livestock for eight weeks after application. Do not graze or harvest treated forage grasses or legumes for forage during the year of treatment.

Brominal M (450 g/L), Bromox 450 M (450 g/L), Sabre (720 g/L) Controls several broadleaf weeds in barley, oats, wheat, flax and canary seed. See *Field Crops Chart*. Apply 1.25 L/ha Brominal M or Bromox 450 M or 780 mL/ha Sabre in at least 20 L/ha water. These products are contact herbicides, therefore through coverage of weeds is important. A water volume of 40 to 50 L/ha is preferred. Swath width must not exceed length of the spray boom.

Apply when weeds are in the two to four leaf stage and before the crop shields the weeds. Canary seed should be treated in the three to five leaf stage, flax when 5 to 10 cm tall. Barley, oats and wheat can be safely treated until the early shot blade stage but weeds will not be adequately controlled once the crop shields the weeds.

These treatments will give some top growth control of Canada thistle and perennial sow thistle but regrowth can be expected.

On flax there may be some leaf burn and a delay in maturity of two or three days. Do not spray in hot, humid weather conditions.

Hoe-Grass (190 g/L) Controls barnyard grass, green and yellow foxtail and wild oats. For wheat, barley, (except Klages, Norbert, Glenn and Betzes) and flax apply at 3.75 L/ha. For all crops, apply in no less than 35 L/ha water at a pressure of no less than 300 kPa. Apply when the grassy weeds are in the one to four leaf stage and before tillering.

Hoe-Grass must be applied in the 1 to 4 leaf stage of barley and before tillering (stooling). Application beyond this stage will result in crop damage. Certain environmental conditions should be avoided when applying Hoe-Grass on barley, i.e. prolonged cool, humid periods, drought and frost.

Do not tank mix Hoe-Grass with any herbicide (for example, Pardner, Torch, 2,4-D, MCPA) as crop damage and reduced grassy weed control will result. Herbicides for the control of broadleaf weeds must be applied at least four days after the application of Hoe-Grass.

Do not tank mix Hoe-Grass with any herbicide, insecticide, fungicide, fertilizer or chemical additive. Do not use raindrop nozzles. Avoid application if rain is expected within one hour.

Do not spray Hoe-Grass if the wind speed is more than 13 km/h.

Matavon (84 g/L) Controls wild oats in wheat (except Selkirk), triticale, canary seed, sunflowers and the following seedling forages — alfalfa, bromegrass, meadow fescue, creeping red fescue, Russian wild ryegrass, intermediate wheatgrass and crested wheatgrass. Use only on forage stands grown for seed production. Apply 5 L/ha except on forage grasses grown without a companion crop where a rate of 7.5 L/ha should be used. Use a total spray volume of not less than 20 L/ha. Apply when wild oats are in the three to six leaf stage and before the crop is past the six leaf stage. Refer to the *Herbicide Information* section for additional instructions.

MCPA amine (barley, oats, wheat) Controls several broadleaf weeds. See *Field Crops Chart*. Apply 1.25 to 1.7 L/ha of formulations containing 500 g/L MCPA when the crop is in the two leaf to early shot blade stage. If only wild mustard, lamb's-quarters and spring seedlings of stinkweed and flixweed are present, the rate can be reduced to 840 mL/ha of formulations containing 500 g/L MCPA. For product volumes of other MCPA amine formulations see Table 10.

MCPA amine (Flax) Controls several broadleaf weeds. See *Field Crops Chart*. Apply 1.25 to 1.7 L/ha of formulations containing 500 g/L MCPA in 55 L water. Apply MCPA from the time flax is 5 cm tall until just before bud stage. Some delay in maturity and crop injury may result from use of the higher rates but will most often be more than offset by increased yields, if the infestation of susceptible weeds is moderate to high. If only wild mustard, lamb's-quarters and spring seedlings of stinkweed or flixweed are present, the rate can be reduced to 840 mL/ha of formulations containing 500 g/L MCPA. For product volumes of other MCPA amine formulation see Table 10.

MCPA amine, 2,4-D amine (Rye, spring or fall) Controls several broadleaf weeds. See *Field Crops Chart*. Apply 1.25 to 1.7 L/ha of formulations containing 500 g/L MCPA or 2,4-D. Apply MCPA when spring rye is in the two leaf to early shot blade stage, or when fall rye commences growth in the spring, until the early shot blade stage. Apply 2,4-D from the four leaf to early shot blade stage. Only a few brands of 2,4-D are registered for application in the fall. If only wild mustard, lamb's-quarters and spring seedlings of stinkweed or flixweed are present, the rate can be reduced to 840 mL/ha of formulations containing 500 g/L MCPA or

2,4-D. For product volumes of other MCPA and 2,4-D formulations see Table 10.

Poast (184 g/L) Controls several grassy weeds in flax, rapeseed (Canola), soybeans and sugar beets. See *Field Crops Chart*. Apply 0.8 to 1.0 L/ha for control of green and yellow foxtail, barnyard grass, proso millet, witchgrass and volunteer corn, 1.4 to 1.6 L/ha for control of wild oats; 1.6 L/ha for control of volunteer wheat and volunteer oats; or 1.9 L/ha for control of volunteer barley. Where a rate range is specified for a weed, use the higher rate to control heavy infestations. Apply in 25 to 50 L/ha of water at a minimum nozzle pressure of 275 kPa. Add 0.75 to 1.0 L/ha of Assist Oil Concentrate. Apply when weeds are in the one to six leaf stage with the majority in the two to five leaf stage. Control may be reduced if grasses are not actively growing due to drought, flooding, or prolonged cool conditions (15° C or less). Do not tank mix with other herbicides. Allow a four day interval between application of Poast and other herbicides.

CAUTION: *Cereal crops, corn, and forage grasses are extremely sensitive to Poast drift. Do not apply if the wind is blowing towards adjacent fields of cereals, corn, or forage grasses. As these crops comprise a major portion of Manitoba's cropped hectarage, opportunities to safely apply Poast by air will be very limited.*

2,4-D amine (barley and wheat) Controls several broadleaf weeds. See *Field Crops Chart*. Apply 1.25 to 1.7 L/ha of formulations containing 500 g/L 2,4-D when the crop is in the four leaf to early shot blade stage. If only wild mustard, lamb's quarters and spring seedlings of stinkweed or flixweed are present, the rate can be reduced to 840 mL/ha of formulations containing 500 g/L 2,4-D. For product volumes of other 2,4-D amine formulations see Table 10.

MCPAK (400 g/L) Controls hemp nettle and other MCPA susceptible weeds in wheat, oats, barley and flax. See *Field Crops Chart*. Apply at 2.1 L/ha when weeds are in the one to four leaf stage. Some injury to flax or delay in flax maturity may result.

Granular

Avadex BW Granular (10%) Controls wild oats. Apply at the rates indicated for specific crops. Fly at a height of 9 m. Incorporate according to instructions in *Herbicide Information* section. The granular formulation is more suited to fall applications than to spring application. Do not apply Avadex BW liquid by air.

Do not seed domestic oats the year after treatment with Avadex BW.

Barley

At 17.5 kg/ha product applied in the fall or before seeding in the spring.

Wheat

At 15 kg/ha product applied in the fall.

Flax, mustard, rapeseed, sugar beets

At 17.5 to 22.5 kg/ha product applied in the fall or before seeding in the spring.

For further aerial recommendations see Brush Control and Desiccation sections.

CAUTION: *Take all possible precautions to prevent drift damage to susceptible crops, shelterbelts, gardens and yard areas.*

Specific Application Instructions

Herbicides requiring specific instructions are included in this section. For other herbicides, refer to the specific recommendation.

Afolan F/Lorox L

For mixing, fill the sprayer half full of clean water. Shake the sealed container vigorously. Slowly add the product to the sprayer while agitating. Empty container and hold in vertical position for 30 seconds. Rinse container with water, again shaking vigorously and letting drain for 30 seconds. Repeat this procedure for a total of three rinsings to ensure that all product has been transferred to the sprayer tank. Finish filling the tank with water while agitating. Spray solution as soon as possible after mixing. If MCPA amine is being used, add the required amount immediately after adding the required amount of Afolan F or Lorox L.

For wheat, barley and oats, Afolan F or Lorox L must be tank mixed with MCPA amine. Do not use other formulations of MCPA other than the amine or crop injury may result. Apply Afolan F or Lorox L plus MCPA amine in 100 L/ha water and a nozzle pressure of 225 to 275 kPa. Apply when cereal crops are in the two to four leaf stage, flax 5 to 10 cm high. Do not graze or feed green plants to livestock and avoid using when the crop is underseeded to forage legumes. For all other crops, follow application rates listed on product label or under those specific crop recommendations.

Avadex BW (Liquid and Granular)

Where a rate range appears, apply the higher rate on deep black soils with high organic matter content. Use the lower rate on light sandy soils.

Liquid Formulation

Apply only to soil that is free from trash and lumps. Incorporate immediately.

Granular Formulation

May be applied under trashy conditions. Particularly suited for fall application. Be sure to calibrate granular herbicide application equipment. Incorporate as soon as possible but within 48 hours of application.

Spring Application

Apply as directed under specific crop recommendation and incorporate.

Fall Application

Apply after October 1, but before freeze-up and incorporate. A shallow tillage of less than 5 cm is required in spring to control early germinating weeds.

Application on Granular Fertilizer

Avadex BW (liquid) may be applied on dry urea fertilizer. Apply to dry urea fertilizer in a standard type of rotary blender. Commercial blending only is recommended. Allow sufficient mixing and blending time to ensure uniform coverage of the dry fertilizer. A minimum of 150 kg/ha of dry urea fertilizer must be used. The Avadex BW-urea mixture should be applied as soon as possible after blending. If a spin spreader is used, 100 percent overlap is required. Incorporate as soon as possible after application.

Incorporation

Do not incorporate Avadex BW more than 5 cm. To do this, set disc and cultivator implements to cut no deeper than 7.5 cm. Harrows are suitable for incorporation on loose, trash free soil. They are not suitable if compact soil prevents penetration of the harrow teeth, if trash accumulates in the harrows or if they bounce. Two incorporations at right angles are necessary for thorough mixing.

Fall Incorporation

One incorporation operation must be done shortly after application. The second operation (at right angles to the first), can be done in the fall or the following spring.

Spring Incorporation

One incorporation operation must be done shortly after application and the second operation can be done immediately after or several days later. When applied after seeding for wheat or barley, incorporate by harrowing twice, at right angles.

Avenge 200-C

Controls wild oats when applied at the three to five leaf stage of the weed. Commencement of tillering of the wild oats in this range of application stages does not interfere with control. If the wild oat population is greater than 200 wild oat plants/square metre, the higher rates are recommended.

Avenge 200-C may be applied by floater-type equipment. The use of postemergent boom kits, equipped with flat fan nozzles, is highly recommended. Liquid pressure should be 275 kPa to deliver 100 L/ha solution, at speeds of 18 to 20 km/h. Heavy dust created by the floater may interfere with the spray and reduce wild oat control.

Avenge 200-C may be applied with a Spray Coupe, provided adequate water volume is used and speed is reduced to 16 to 20 km/h. Calibrate equipment to apply at least 40 to 50 L/ha of the solution under at least 300 kPa pressure.

Avenge 200-C may be tank mixed with certain broadleaf herbicides to permit wild oat and broadleaf weed control with a single pass over the field. Only some broadleaf herbicides are recommended for this procedure, (Buctril M, Brominal M, Bromox 450 M, Pardner, Sabre, Torch, Torch DS, 2,4-D LV ester, MCPA ester). Do not apply tank mixes if wheat or barley are underseeded to forage grasses or legumes.

Refer to the manufacturer's label on the broadleaf herbicide chosen for tank mix recommendations. Apply the combination so as to provide good coverage for the broadleaf herbicide.

- Products not listed for tank mixing with Avenge 200-C, may affect crop tolerance or wild oat control. A four day delay between sprays is recommended.
- Do not apply Avenge 200-C to crops under severe drought stress.
- Avoid applying Avenge 200-C if rain is forecast within six hours, or when the crop is wet with heavy dew.
- Do not apply Avenge 200-C to the crop after the six leaf stage.
- Do not graze or feed treated cereal vegetation to livestock until eight weeks after application. Do not graze or harvest treated forage grasses or legumes for forage in the year of treatment.

Blagal

Blagal is a postemergent herbicide for the control of broadleaf weeds in wheat, barley, oats and flax. Best control will be achieved when Blagal is applied to weeds which are small and actively growing and before the five leaf stage. Do not apply Blagal to weeds in the cotyledon stage. For best results on Canada thistle the application should be delayed until cereal crops are in the five leaf stage and flax is 10 cm in height. Good spray coverage of the weeds is essential for good results. This is best achieved by using a minimum of 100 L/ha of water, nozzle pressure of 275 kPa and flat fan spray nozzles. Do not use flood jet nozzles. Only 50 mesh metal filters and nozzle screens should be used. If the spray mixture is allowed to stand for several hours, vigorous agitation is required to resuspend the material. Rainfall within four hours after application will reduce the effectiveness of the Blagal treatment.

Carbyne 2 EC

For best wild oat control it is essential that the spray be broken up into small droplets and applied uniformly to assure maximum coverage of each wild oat plant. Apply when the crop is dry (no dew or rain).

Ground sprayers

Apply Carbyne 2 EC in a total spray volume of 45 L/ha water using a pressure of 300 kPa. Rotate the boom to direct spray forward so that the spray hits the wild oats at a 45° angle. Be sure to lower boom height to maintain correct spray pattern.

When wind velocity is less than 15 km/h the following fan type nozzles are recommended on 50 cm spacings: Monarch 20 and 22, Spray Jet 65.067, Tee Jet 650067, 730077 and 800067. When wind velocity is 15 to 30 km/h, the following flood type nozzles are recommended: TK 0.75 and D.75. When these nozzles are used, they should be spaced at 100 cm on the boom and the spray directed forward at 45°, angled into the crop. Boom heights should be adjusted 20 to 25 cm above the crop to give proper coverage.

Spra-Coupes

Use Tee Jet 730116 and LF 1.16-73 at a pressure of 350 kPa and a speed of 10 km/h or Tee Jet 730154 and LF 1.54-73 at a pressure of 450 kPa and a speed of 15 km/h.

Dual

Prepare a firm level seedbed, free from lumps and surface trash. Do not use Dual on loose or rough seedbeds. It may be applied alone or as a tank mix with other products. When applying split applications or tank mixing with another product, consult the label for any precautions regarding rotational crops.

Optimum results are obtained when adequate rainfall occurs within 10 days after application. If drought conditions persist a shallow cultivation or rotary hoeing of weed escapes may be required.

Incorporation

Apply as a broadcast treatment and incorporate thoroughly into the top 5 cm of soil prior to planting. To ensure shallow incorporation of 5 cm use: (1) power driven cultivation equipment set to a depth of 5 cm; or (2) tandem discs set to cut to a depth of 10 cm operated at 7 to 10 km/h; or (3) "S-tine" (Danish) cultivators with tines on 15 to 20 cm centres, set 10 cm deep and operated at 10 to 13 km/h, followed by a harrow or some other levelling device which extends beyond the ends of the cultivator. Immediate incorporation is not necessary with Dual. Under irrigated conditions incorporation is not necessary provided that application is followed within 10 days by rainfall or irrigation of at least 1.25 cm.

Eptam (liquid or granular)

Use the lower rate on light sandy soils and the higher rate on heavier textured soils. Do not use on muck or

peat soils with more than 15 per cent organic matter. Apply Eptam 8-E to a dry trash-free soil. Eptam 10 G granular can be applied to a trashy soil surface.

Spring Application

Apply before planting and incorporate. Establish a firm seedbed before planting.

Fall Application

Apply as close to freeze-up as possible, when soil temperatures are low and incorporate. A shallow cultivation will be required in the spring to control early germinating weeds.

Application on Granular Fertilizer

Dry bulk fertilizers except nitrate fertilizers may be impregnated or coated with Eptam 8-E. The Eptam 8-E should be uniformly spread onto the dry bulk fertilizer during the blending process. A minimum rate of 200 kg/ha of fertilizer is necessary to ensure adequate distribution. The impregnated fertilizer should be spread uniformly onto the field using a double overlap pattern immediately after impregnation. The impregnated fertilizer must be applied to the field when the soil surface is dry to at least 1.5 cm depth. The first incorporation must be done immediately after application.

Incorporation

Incorporate immediately after application (within minutes) preferably during the spraying operation as Eptam is volatile. Set disc implements and cultivators to cut to a depth of 10 to 15 cm. Operate disc implements at 6.5 to 9.5 km/h and cultivators at 9.5 km/h or more. A second operation at a right angle to the first is required. The cultivator or disc must be followed by a harrow or other levelling device which extends beyond the end of the implement. Power driven equipment (for example, rotovator) should be set to cut at a depth of 5 to 7.5 cm. A second operation is not required with power driven equipment.

Eradicane and Sutan + (Also mixes with Aatrex, Atrazine or Bladex)

Use the lower rate on light sandy soils and the higher rate on heavier textured soils. Do not use on muck or peat soils with more than 15 per cent organic matter. Apply to a dry trash free soil.

Spring Application

Apply before planting and incorporate. Establish a firm seedbed before planting.

Application on Dry Granular Fertiliser

Eradicane 8-E and Sutan + alone or in combination with atrazine may be sprayed onto or impregnated on dry fertilizer. Spray the herbicide onto the fertilizer during the blending process using a rotary drum type blender. A minimum of 200 kg/ha of fertiliser is necessary to ensure uniform distribution in the soil. Most fertilizers, except nitrate fertilizers are suitable for this application. See the product label for a complete listing of recommended fertilizer types. The impregnated fertilizer should be applied to a dry soil surface using a double overlap pattern to ensure adequate distribution. Incorporate within 1 hour of application.

Incorporation

Incorporate immediately after application (within minutes) preferably during the spraying operation as Eradicane and Sutan+ are volatile. Set disc implements and cultivators to cut to a depth of 10 to 15 cm. Operate disc implements at 6.5 to 9.5 km/h and cultivators at 9.5 km/h or more. A second operation at right angles to the first is required. The cultivator or disc must be followed by a harrow or some other levelling device which extends beyond the ends of the implements.

Hoe-Grass

Hoe-Grass is a foliar applied herbicide which acts by contact and systemic action. Apply when the grassy weeds are in the one to four leaf stage and when the majority are in the two and three leaf stage. Treatment must take place before tillering (stooling) of the grassy weeds. Volunteer corn must be treated when 15 to 25 cm in height.

Barley must be sprayed in the one to four leaf stage of the crop and prior to tillering (usually no later than 21 days after emergence of the crop). Do not use on Klages, Norbert, Glenn or Betzes varieties. Application of Hoe-Grass during periods of stress (for example, above 28°C, during dry conditions, or when humidity is very low) when plants are not actively growing may result in significantly reduced weed control.

Hoe-Grass may be tank mixed with Pardner or Torch (not for aerial application) on some crops. When grassy weeds are not actively growing (for example, under very dry conditions), tank mixing Hoe-Grass with Pardner or Torch may result in reduced grassy weed control. Mixing Hoe-Grass with other herbicides will result in greatly reduced grassy weed control. Delay the application of other herbicides for broadleaf weed control until at least four days after Hoe-Grass application.

Apply Hoe-Grass in 110 L/ha of water using ground equipment operated at 6 to 8 km/h equipped with 80 flat fan nozzles directed forward at an angle of 45° and a nozzle pressure of 275 kPa.

When applying Hoe-Grass through floater type equipment thorough spray coverage on the growing point of the grassy weed is extremely important. The following application parameters must be followed in order

to ensure such coverage and maximum control by Hoe-Grass:

- Low boom height, maximum 60 cm above the crop canopy
- Do not use flood jet nozzles
- Use flat fan type nozzles spaced at 50 cm
- Maximum speed of 18 km/h
- Minimum volume of 110 L/ha
- Minimum pressure of 275 kPa
- Boom angle 45° forward
- Thoroughly wash spray tank before using Hoe-Grass.

Apply when weeds are actively growing. Do not apply if rain is expected within one hour after application. Hoe-Grass should not be mixed with insecticides, fungicides, fertilizers, or any other chemicals or additives (except Pardner or Torch). Avoid grazing treated forage legumes or grasses prior to harvest.

Hoe-Grass II

Hoe-Grass II is a foliar applied herbicide which acts by contact and systemic action. Apply when the grassy weeds are in the one to four leaf stage (15-25 cm in height for volunteer corn) and when broadleaved weeds are in the seedling to early four leaf stage (seedling to 5 cm in height for Russian Thistle). For the best results and maximum yield enhancement apply Hoe-Grass II early, when the majority of the weeds are in the two to three leaf stage.

Application of Hoe-Grass II must take place prior to tillering (stooling) of the grassy weeds and no later than the early four leaf stage for broadleaved weeds. Late application will result in poor weed control. If uneven weed seedling germination exists, consult your local weed specialist for the best method of weed control.

Barley must be sprayed in the one to four leaf stage of the crop and prior to tillering (usually no later than 21 days after crop emergence). Under certain conditions (drought, frost, prolonged cool and humid periods) barley varieties Norbert, Glen, Klages and Betzes are especially sensitive. Hoe-Grass II must be applied when flax is 5-10 cm in height. Avoid spraying flax under stressful conditions (eg; very hot 28° C and/or humid conditions). Do not apply to wheat, barley, or flax underseeded to legumes. Note under periods of stress (eg; above 28° C during dry conditions or when humidity is low) weed control may be reduced.

Hoe-Grass II is not registered for aerial applications. The mixing of other herbicides with Hoe-Grass II will result in reduced weed control. If rain is expected within one hour of application do not apply. Do not graze treated fields prior to harvest nor treated within 60 days of harvest. The general application parameters for Hoe-Grass II are the same as for Hoe-Grass. Please consult Hoe-Grass in this section for details.

Kerb 50-W

Kerb 50-W must be applied in the fall between October 1 and freeze-up. Apply in 200 L/ha water. Use only 50 mesh metal filters and nozzle screens. Kerb 50-W is a root absorbed herbicide. Moisture from snow melt carries the herbicide into the root zone of the foxtail barley killing the weed and germinating seedlings when they begin to grow in the spring.

At the recommended rates, pasture stands of perennial bluegrass and fescue may be reduced by 10 to 15 per cent; however rejuvenation will occur quickly during the growing season. Where perennial bluegrass (example, Kentucky) and fescues (example, creeping red) are the dominant pasturegrass species, use the lower rates of Kerb 50-W. Spray overlaps may seriously harm desirable pasturegrass species.

Do not use Kerb 50-W for foxtail barley removal in seed grass stands or desired forage stands of Timothy or fescue grass species.

In instances where foxtail barley comprises most of the grass stand and reseeding to a desirable grass species is desired, delay seeding into the Kerb treated soil until the end of June. Do not harvest or graze within 60 days after application with Kerb 50-W. Avoid using Kerb 50-W on soils having more than 6 per cent organic matter.

Lasso

Use the lower rate on sandy or loam soils with less than 3 per cent organic matter. Apply to a firm level seedbed. Lasso may be tank mixed with Atrazine or Bladex for preemergence application under irrigated conditions. Other registered tank mixes are currently not recommended for Manitoba.

Moisture is required for optimum control. A shallow cultivation of weed escapes may be required when prolonged drought conditions exist following Lasso application.

Incorporation

Incorporate into the top 5 cm of soil within 7 days of seeding. Set incorporation equipment (disc recommended) to cut at 7.5 to 10 cm so that the herbicide is distributed in the top 5 cm of soil. To ensure uniform incorporation operate the disc at 8 to 10 km/h. Under irrigated conditions incorporation is not required provided that application is followed within 7 days by 0.8 to 1.8 cm of rain or irrigation.

Lexone / Sencor

Lexone and Sencor are systemic herbicides which are absorbed by both the foliage and the root system of the

plant. Affected plants are chlorotic and stunted. Death usually occurs 10 to 14 days after treatment. Lexone and Sencor leave a residue in the soil which may control shallow germinating weeds throughout the season.

Do not mix Lexone and Sencor with pesticides other than those recommended (MCPA or Banvel), or with liquid fertilizers.

Apply with ground equipment operated at 6 to 8 km/h using 80 to 100 L/ha water. Stainless steel nozzles are recommended. Do not use flood jet nozzles. Use 50 mesh or larger line strainer and screens. Agitation is required.

Do not apply more than once per season or use in a crop underseeded to forage. Avoid grazing or feeding treated crop to livestock within 30 days of application and do not harvest for grain within 60 days of application.

CAUTION: *When applied as a preplant treatment, Lexone and Sencor leave residues in the soil which may affect subsequent crops. Do not sow fall seeded crops the same season as the application of Sencor or Lexone. Do not seed rapeseed, sunfloweers, sugar beets, onions, celery, peppers, cole crops, lettuce, spinach, red beets, turnips, pumpkin, squash, cucumbers or melons the year following preplant applications of Sencor or Lexone.*

Lorox L

See Afolan F

Mataven

Mataven is a postemergent wild oat herbicide which selectively controls wild oats by contact and systemic action. Apply Mataven when the majority of wild oats are in the three to six leaf stage and the crop is not beyond the six leaf stage. When wild oat infestations are heavy, treatment at the early stage (three to four leaf) will maximize crop yields by reducing competition. Later treatments, when wild oats are more mature (four to six leaf), will provide more complete control of late emerging wild oats.

For optimum results with ground application equipment, Mataven should be applied in 100 L/ha water at a minimum pressure of 300 kPa. Good spray coverage is essential for heavy wild oat infestations and crop canopies. Under these conditions the spray coverage can be improved by using the high application volume and directing the spray at 45° in the direction of travel.

Do not mix Mataven with broadleaf herbicides. To avoid reduced control of wild oats and interval of four days is required between Mataven and Brominal M, Bromox 450 M, Buctril M, MCPA, Pardner, Sabre, Torch or Torch DS applications. An interval of seven days is required between Mataven and other broadleaf herbicides (examples, Banvel or 2,4-D).

Primextra

Primextra leaves a residue in the soil which may affect crops in the following year. Flax, peas and fababeans are more tolerant crops and should be considered to follow corn. Do not use on muck or peat soils, or coarse textured soils low in organic matter. Prepare a firm level seedbed, free from lumps and surface trash prior to application.

Incorporation

Apply as a broadcast treatment and incorporate thoroughly into the top 5 cm of soil prior to planting. To ensure shallow incorporation of 5 cm use: (1) power driven cultivation equipment set to cut to a depth of 5 cm; or (2) tandem discs set to cut to a depth of 10 cm at 6 to 10 km/h; or (3) S-tine (Danish) cultivators with tines on 15 to 20 cm centres set 10 cm deep and operated at 10 to 13 km/h; followed by a harrow or some other levelling device which extends beyond the ends of the cultivator.

Roundup

Roundup is a foliar applied non-selective, non-residual, systemic type chemical. For best results apply when plants are actively growing or well established so sufficient movement of the chemical will occur into the root systems of perennial plants to give effective control. Spray coverage should be uniform and complete. Do not spray to runoff.

Avoid tilling before application as this will break up underground plant parts and prevent movement in the plant. Mowing prior to application will also reduce effectiveness of the chemical. Do not till for five to ten days after treatment to allow for movement of the chemical into the roots. Tillage is not required for good control.

If a frost has occurred, wait several days to determine if the quackgrass has recovered. Quackgrass can be treated after a mild frost provided there are three to four green leaves actively growing at the time of application. Do not apply after the first damaging frost in the fall. Heavy rainfall within two hours after application may wash the chemical off the foliage and a repeat treatment may be required. Rainfall occurring within six hours after application may reduce effectiveness.

NOTE: *Reduced control may result on quackgrass which has become sodbound (heavy growth undisturbed for more than two years). Sodbound quackgrass should be tilled and allowed a suitable regrowth period prior to application in order to stimulate growth of dormant parts.*

Sencor

See Lexone

Stampede 360 and Stampede CM

Stampede 360 and Stampede CM are contact herbicides. Thorough spray coverage of weeds is required for best results. Spray early using 100 L/ha flat fan nozzles such as LF-2, 80, 8002, 6502 or LF-2, 65. Spray at 275 kPa with a ground speed of 8 km/h, this will result in 100 L/ha using the above nozzles.

Under conditions of severe stress (drought, flooding etc.) application of Stampede 360 or Stampede CM may affect crop maturity. This becomes more important with later seedings.

Stampede 360 may be tank mixed with MCPA ester or 2,4-D amine or LV ester. Do not tank mix Stampede 360 or Stampede CM with other pesticides, liquid fertilizers or additives. Maintain a three day interval between application of Stampede 360 and Stampede CM and other herbicides. Do not apply if rain is expected within one hour. Do not leave spray solution in sprayer tank overnight.

The following insecticides are the only products registered for safe use in the same year that Stampede CM or Stampede 360 is applied. Furadan may be used for grasshopper control on wheat if applied 5 days or longer after an application of Stampede 360 or Stampede CM, and on barley if applied 10 days or longer after an application of Stampede 360 or Stampede CM. For Dimethoate (Cygon) or Malathion, allow 14 days after an application of Stampede 360 or Stampede CM. Crops grown from seed treated with dual purpose (insecticide/fungicide) seed dressings may be treated with Stampede 360 or Stampede CM.

Stampede 360 and Stampede CM may be applied using "Floater" spray equipment provided 150 L/ha spray volume is used.

Tordon 202C

Tordon 202C is active at low rates on certain broadleaf species and remains in the soil the year following treatment. Do not treat barley or wheat crops underseeded to a legume. Sensitive crops such as sunflowers, beans, peas or potatoes should not be planted within two years following treatment. Replant to wheat, barley, oats, flax or rapeseed for two years following treatment.

Do not overdose or overlap spray swaths as crop injury may result. Avoid grazing treated fields within two weeks after treatment.

Avoid spray drift onto sensitive crops. Low pressure and coarse spray droplets minimize spray drift. Small amounts of Tordon 202C can damage species such as alfalfa, beans, peas, potatoes, sunflowers, sugar beets, tomatoes, and other field or vegetable crops, flowers, fruit plants, ornamentals and shade trees if applied to them during either the growing or dormant period.

Avoid contamination of non-target land, water or irrigation ditches. Do not use Tordon 202C in bodies of water, irrigation ditches, or areas where surface water can run off to adjacent croplands either planted or to be planted to sensitive crops.

Do not use straw from treated crops for composting or mulching susceptible broadleaf crops. If straw is used for bedding or animal feed return manure to fields to be planted to wheat, barley, oats, flax or rapeseed.

Do not remove soil from fields treated with Tordon 202C.

Do not mix Tordon 202C with any other pesticides.

Treflan (liquid and granular)

Recommended rates vary with soil type, time of application and the weed problem. Use the lowest recommended rate on light sandy soils up to 6 percent organic matter. Use the higher rates on loam and clay soils with higher organic matter content. On these heavier soils the recommended rates vary for spring or fall preplant incorporated applications, depending on the expected wild oat problem. See Spring and Fall sections for more detail.

Liquid Formulation

Apply to a trash free soil (80 per cent black when viewed from above) only. Treflan EC is available in two liquid formulations. All recommendations in this Guide refer to Treflan EC 545 g/L formulation.

Granular Formulation

May be applied under trashy conditions. This formulation is particularly suited for fall application. Be sure to calibrate granular applicator for Treflan granules before applying. Delay second incorporation at least two to three days.

Spring Application

Apply as directed in the specific crop recommendation and incorporate. Establish a firm seedbed before planting.

For all spring applied, preplant incorporated recommendations on heavier textured soils with 6 to 15 percent organic matter, apply 2.6 L/ha or 28 kg/ha granular product where a heavy wild oat infestation is expected. Where light wild oat infestations are anticipated on these soils apply 2.0 L/ha or 22 kg/ha granular product. Use the lowest recommended rates on light sandy soils up to 6 percent organic matter.

The initial incorporation must not be more than twenty-four hours after application.

Summer Application

Treflan can be applied to summerfallow between June 1 and September 1 for weed control in rape or flax the following year. Apply the summer rate and incorporate. Treflan must be incorporated at least twice with

the implement operated at right angles. The initial incorporation must not be more than twenty-four hours after application. The second incorporation (and subsequent incorporations) may be done whenever necessary to destroy resistant weed growth during the remainder of the fallow season. Shallow tillage, 5 to 7.5 cm is necessary in the spring prior to planting.

Fall Application

Treflan can be applied in the fall after September 1 and up to soil freeze-up for weed control the following year. Apply fall rates and incorporate. One incorporation may be done in the fall and the second in the spring at the time of seedbed preparation, provided that both operations are done at the recommended depth. However, it is preferred to do both incorporations in the fall followed by shallow tillage, 5 to 7.5 cm in the spring prior to planting. The initial incorporation must not be more than twenty-four hours after application.

For all fall applied recommendations on heavier textured soils with 6 to 15 percent organic matter, apply 3.0 L/ha or 34 kg/ha granular product where a heavy wild oat infestation is expected. Where light wild oat infestations are anticipated on these soils apply 2.6 L/ha or 28 kg/ha granular product. Use the lowest recommended rates on light sandy soils up to 6 percent organic matter.

Incorporation

Work Treflan into the soil in two different directions (at right angles). Use a tandem disc, discer or field (vibrating shank type) cultivator set to work 7.5 to 10 cm deep for the first incorporation. Disc or cultivate in a cross direction at the same depth. Operate disc implements at 7 to 10 km/h, cultivators at 10 to 13 km/h.

Treflan should not be incorporated with a field cultivator when the soil is crusted, lumpy, or too wet for good mixing action. Disc type implements are preferred on stubble.

Incorporation with implements set to cut more than 10 cm deep may result in erratic weed control or crop damage.

In barley and wheat, spring apply Treflan as soon after seeding as possible. Shallow incorporate twice (at right angles) with a diamond or tyne harrow, operated at speeds of at least 8 km/h.

Rodweeders, harrows, or hoe drills, will not properly incorporate Treflan, except in barley and wheat, where a shallow incorporation with harrows is recommended.

CAUTION: *Do not seed sugar beets, oats, fall rye, canary seed or small seeded grasses for 18 months after a spring application or 22 months after a fall application of Treflan. Corn may also be sensitive to higher rates of application.*

TABLE 9 — PRODUCT REQUIRED FOR VARIOUS ATRAZINE FORMULATIONS

Atrazine recommendations are based on liquid formulations containing 500 g/L atrazine and wettable powder formulations containing 90 percent atrazine. Use the following chart to determine equivalent rates of other formulations.

Metric

		ACTIVE RATE (kg/ha)								
PRODUCT NAME	CONCENTRATION	1.2	1.5	1.75	2.0	2.25	2.5	2.75	3.0	3.35
Aatrex Liquid Atrazine Liquid Liquid Atrazine	500 g/L	2.4 L/ha	3.0 L/ha	3.5 L/ha	4.0 L/ha	4.5 L/ha	5.0 L/ha	5.5 L/ha	6.0 L/ha	6.7 L/ha
Aatrex Nine-0 Aatrex 90 W	90%	1.3 kg/ha	1.7 kg/ha	1.9 kg/ha	2.2 kg/ha	2.5 kg/ha	2.8 kg/ha	3.1 kg/ha	3.3 kg/ha	3.7 kg/ha
Atrazine 80 W	80%	1.5 kg/ha	1.9 kg/ha	2.2 kg/ha	2.5 kg/ha	2.8 kg/ha	3.1 kg/ha	3.4 kg/ha	3.75 kg/ha	4.19 kg/ha

TABLE 10. PRODUCT VOLUME REQUIRED FOR VARIOUS MCPA or 2,4-D FORMULATIONS

MCPA and 2,4-D recommendations are based on formulations containing 500 g/L MCPA or 2,4-D. Where other concentrations are to be used, locate the volume of 500 g/L formulation recommended and read across to the concentration being used. Do not substitute amine or ester formulations where the other formulation is specified.

Litres per hectare (L/ha) unless otherwise indicated.*

Metric

ACTIVE RATE		CONCENTRATION (g/L)						
g/ha	kg/ha	250	300	400	500	600	700	800
275		1.10	917 mL/ha	688 mL/ha	550 mL/ha	458 mL/ha	393 mL/ha	347 mL/ha
280		1.12	933 mL/ha	700 mL/ha	560 mL/ha	467 mL/ha	400 mL/ha	350 mL/ha
350		1.40	1.17	875 mL/ha	700 mL/ha	583 mL/ha	500 mL/ha	438 mL/ha
420		1.68	1.40	1.05	840 mL/ha	700 mL/ha	600 mL/ha	525 mL/ha
425		1.70	1.42	1.06	850 mL/ha	708 mL/ha	607 mL/ha	531 mL/ha
550		2.20	1.83	1.38	1.10	917 mL/ha	786 mL/ha	688 mL/ha
560		2.24	1.87	1.40	1.12	933 mL/ha	800 mL/ha	700 mL/ha
630		2.52	2.10	1.58	1.26	1.05	900 mL/ha	788 mL/ha
700		2.8	2.33	1.75	1.40	1.17	1.00	875 mL/ha
840		3.36	2.80	2.10	1.68	1.40	1.20	1.05
850		3.40	2.83	2.13	1.70	1.42	1.21	1.06
1120	1.12	4.48	3.73	2.80	2.24	1.87	1.60	1.40
	2.00	8.00	6.67	5.00	4.00	3.33	2.86	2.50
	2.24	8.96	7.47	5.60	4.48	3.73	3.20	2.80
	2.50	10.0	8.33	6.25	5.00	4.16	3.57	3.13
	4.48	17.9	14.9	11.2	8.96	7.47	6.40	5.60
	4.50	18.0	15.0	11.3	9.00	7.50	6.43	5.63

*1 L/ha = 1000 mL/ha

Liquid Fertilizer Mixes

The mixing of herbicides in liquid fertilizer for application should be carried out only for products which are recommended for this use.

Thorough mixing and even application are required. Accurate calibration should be carried out to ensure the proper rate of herbicide application.

Compatibility of the herbicide in the liquid fertilizer should be tested before the herbicide is added to the tank. All registered products outline this procedure.

The following products can be applied with liquid fertilizer:

Aatrex
Avadex BW
Dual-Ciba-Giegy
Eptam
Eradicane 8-E (alone or with Aatrex)
Lasso
Primextra
Ro-Neet 7.2E
Sutan (alone or with Aatrex)
Treflan (alone or with Avadex BW)

TABLE 11. GRAZING AND FEEDING RESTRICTIONS

This table summarizes label restrictions for herbicides recommended for cereal or forage crops. C[illegible]ult product labels for specific information and for other crops.

PRODUCT	RESTRICTION
Afolan F/Lorox	Do not graze or feed green plants to livestock.
Amitrol T	Do not graze until six months following treatment.
Asulox F	Do not graze or feed treated crop.
Avadex BW	*Cereals* none *Forage legumes* Do not harvest as forage in the year of seeding.
Avenge 200 C	Do not graze or feed cereals for eight weeks after treatment. Do not graze or harvest forage grasses or legumes for forage in the year of treatment.
Banvel	*Cereals* Do not graze or harvest for livestock feed prior to crop maturity. *Pasture and forages* Do not graze or feed *dairy animals* within 7 to 60 days of treatment, depending on rate of Banvel applied. See product label for additional detail. Do not graze or feed *slaughter animals* within 28 days of treatment. Forage harvested within 28 days of treatment should not be fed to slaughter animals within 28 days of slaughter. There is no restriction for livestock other than dairy or slaughter animals.
Blagal	Do not graze or feed green plants to livestock.
Brominal M/Bromox 450 M/ Buctril M/Pardner/Sabre/ Torch/Torch DS	None, except with Torch, Torch DS on forages. Do not graze or harvest forage grasses for feed in the year of treatment with Torch or Torch DS.
Carbyne	Do not graze or feed crop for five weeks after treatment.
Dowpon/Dalapon/Basfapon	Do not feed first year cuttings to dairy animals or animals being finished for slaughter.
DyVel	Do not graze or harvest for livestock feed prior to crop maturity.
Embutox E/Tropotox/Tropotox Plus/Cobutox/2,4-D Butyric 400	None
Eptam	None
Hoe-Grass	Do not graze treated cereal crops. Straw can be used for bedding or feed after harvest of the crop. Do not graze treated forages.
Hoe-Grass II	Do not graze treated fields prior to harvest.
Kerb	Do not harvest or graze within 60 days after application.
Kil-Mor	None

PRODUCT	RESTRICTION
Lexone/Sencor	Do not graze or feed treated cereal crops within 30 days of application, or peas 70 days after application.
Mataven	Do not graze or feed treated wheat before maturity. Straw can be used for bedding or feed after harvest of the crop. Do not graze or harvest forage grasses or legumes for feed in the year of treatment.
MCPA	Do not graze dairy cattle within seven days of spraying.
MCPP	None
Poast	Do not graze treated fields or harvest for feed prior to crop maturity.
Princep Nine-T/Simadex/Simazine	Do not graze for 30 days or cut for hay within 60 days of application.
Roundup	Do not graze or harvest treated areas until treated plants have turned brown and started to deteriorate.
Sinbar	None
Stampede/Stampede CM	None
Target	None
TCA	Do not graze treated cereal crops for at least 24 hours after spraying.
Tordon 202 C	See label for precautions on use of manure when treated crop is fed.
Treflan	None
2,4-D	Do not graze for 24 hours after treatment.
2,4,5-T	Do not graze for seven days after treatment.

TABLE 12. EFFECT OF RAINFALL ON HERBICIDE EFFICACY

Rainfall shortly after application of a postemergence herbicide may reduce weed control. Effect will vary with the product, the interval between spraying and rainfall and the amount and duration of rainfall. The following guidelines are based on label information and additional detail supplied by the chemical industry. Use the longest time interval when considering tank mixes.

INTERVAL REQUIRED*	PRODUCT		
15 minutes	Carbyne		
30 minutes	Brominal M	Pardner	Torch DS
	Bromox 450 M	Sabre	
	Buctril M	Torch	
1 hour	Embutox E	Stampede 360	Cobutox
	Hoe-Grass	Stampede CM	2,4-D Butyric
	Hoe-Grass II	TCA	Poast
2 hours	Lexone		
	Mataven		
	MCPA ester		
	2,4-D LV ester		
3 hours	Target		
	MCPA estemine		
	2,4-D estemine		
4 hours	Banvel	Lorox + MCPA	
	Benazolin	MCPA amine	
	Blagal	Tordon 202 C	
	Dalapon	Tropotox Plus	
	DyVel	2,4-D amine	
6 hours	Avenge 200 C	MCPAK	Sencor
	Betanex	MCPA sodium salt	
	Kil-Mor	Roundup	
8 hours	Amitrol-T		
	Asulox F		
	Basagran		

*Time generally required between application and rainfall to avoid significant reduction in efficacy.

TABLE 13 — SOIL RESIDUES SUMMARY

Several herbicides recommended for field or forage crops leave a residue in the soil, affecting subsequent crops in the rotation. This table summarizes available information. Product labels provide specific information.

Herbicides applied in the fall or on summerfallow may also leave a residue in the soil (example, high rates of Banvel, Tordon 22 K). Check recommendations or product labels for precautions.

PRODUCT	CROPS WHICH MAY BE AFFECTED THE YEAR FOLLOWING USE OF THE HERBICIDE
Atrazine *(includes all products containing atrazine)*	All crops except corn. Flax, peas and faba beans have some tolerance to atrazine residues. If rate of application exceeds 1.1 kg/ha active (1.0 lb/A) only corn should be grown the following year. Atrazine residues may persist for more than one year.
Avadex BW	Oats
Bladex	All crops except corn, cereals, potatoes, flax, rapeseed (Canola), sunflowers, soybeans or peas.
Primextra	All crops except corn. Primextra contains atrazine. See comment for atrazine.
Princep Nine-T, Simadex, Simazine	All crops except established forage legumes where recommended. Soil residues may persist for two or more years.
Sencor / Lexone *(preplant recommendations)*	Rapeseed, sunflowers, sugar beets, onions, celery, peppers, cole crops, lettuce, spinach, red beets, turnips, pumpkin, squash, cucumbers and melons. Fall seeded crops may also be injured when seeded within the same season as the application of Sencor or Lexone.
Sinbar	All crops except established alfalfa as recommended. Sinbar residues may persist for two or more years.
Tordon 202 C	Several broadleaved crops including forage legumes, sunflowers, beans, peas, potatoes, sugar beets and horticultural crops. Replant to wheat, barley, oats, flax or rapeseed for two years following treatment.
Treflan	Sugar beets, red beets, oats, fall rye, canary seed or small seeded grasses. Corn may also be sensitive to higher rates of application.

Winter storage of herbicides

Heated storage

Herbicides which must be kept in heated storage (DO NOT FREEZE)

Agriculture Weedkiller No. 1
Afolan F
Alanap 3
Amiben
Amitrol-T
Amizine
Asulox F
Atra-Mix
Avadex BW Liquid
Avenge 200-C (above 4°C)
Banvel
Basagran
Benazolin
Betasan
Blagal
Brominal M
Bromox 450 M
Buctril M
Chipman Dandelion Killer
Chipman Lawn Weed Killer
Chipman Premium Lawn Killer
Chloro-IPC
Compitox
Compitox Plus
Co-op Lawn Weed Killer
Co-op Premium Lawn Weed Killer
Co-op Premium Spot Weed Killer
Co-op Premium Turf Herbicide
Dowfume MC 2
Dy-Amine
Dyanap
DyCleer
DyCleer 24
Dytop
DyVel
Embark
Estemines (2,4-D, MCPA)
Formula 40C
Esteron 600
Esteron LV-600
Esteron 99
Gramoxone
Gramoxone S
Herbicide 273
Hoe Grass
Hoe-Grass II
Hyvar XL
Killex
Kil-mor
Laddok
Lasso
Lorox L
1500 M Herbicide
Mataven
MCPA - amines, potassium and sodium salts
Mecoprop 300
Mecoturf
Mecoturf Plus 2,4-D
Nortron
Pardner
Phenoxylene Plus
Potato Top Killer 300
Prefar
Premerge 360
Primatol Liquid
Randox
Reglone
Reglone A
Ro-Neet 7.2E
Simadex
Sinox General
Sinox PE
Sweep
Target
TCA Solution
Topper
Torch
Tordon 22K
Tordon 101
Tordon 202C
Totril
Tropotox
Tropotox Plus
2,4-D amine
Weed-No-More
Yellow Stuff PE

Storage at freezing temperatures

Herbicides which may be stored at freezing temperatures. These must be returned to their original state by warming to room temperature 20 to 22°C, and agitating thoroughly before use.

AAtrex Liquid
AAtrex Plus
Atrazine Liquid
Betanel
Betanex
Bladex Liquid
Brushkill
Carbyne 2 EC
Cobutox
Co-op Atrazine 5L
Desormone 7
Diphenoprop 700
Dual-Ciba-Geigy
Dytop
Embutox E
Eptam 8-E
Eradicane 8-E
Estaprop
Esters of 2,4-D
MCPA,2,4,5-T
Lexone L
Poast
Primatol Liquid
Primextra
Propaturf
Roundup
Sabre
Sencor 500
Silvaprop
Sutan +
Stampede 360
Stampede CM
Torch DS
Treflan EC
2,4-D Butyric 400
Vapam (above - 17°C)
Vorlex

Herbicides normally sold as granules or powders: (These are not usually damaged by freezing.) Store in dry place.

AAtrex 90 WP
AAtrex Nine-0
Allizol
Atra-pell
Atrazine 80W
Avadex BW 10G
Banvel 5G
Basamid
Basfapon
Betasan 12.5G
Bladex 80W
Bluestone
Calmix pellets
Casoron 4G
Co-op Garden Weed Preventer
Co-op Granular Soil Sterilant
Co-op Total Vegetation Control
Co-op Weedrite Granules
Dalapon
Dowpon
Dowpon M
DyCleer 10P
Enide
Eptam 10G
Eramox 80W
Granular Soil Sterilants
Hoe-No-More
Hyvar X
Karmex
Kerb 50-W
Krovar I
Lexone DF
Mylone
Nata TCA
No-Hoe
Primatol 80WP
Primatol 5:5G
Princep Nine-T
Princep 4G
Sencor 75 DF
Simadex 80W
Simmaprim 80W
Sinbar
Spike 80WP
Spike 5G
TCA
Tenoran 50W
Tordon 10K
Treflan QR5
Velpar
Weedrite

TABLE 14 — HERBICIDE CONCENTRATION AND AVAILABILITY

NOTE: *Product availability code follows this table.*

SYMBOLS:

EC	— emulsifiable concentrate
F	— flowable
G	— granular
SN	— solution
P	— pellets
WDG	— water dispersible granule
WP	— wettable powder
WSP	— water soluble powder
g/L	— grams/litre

TRADE NAME	GENERIC NAME	ACTIVE INGREDIENT AND FORMULATION	MANUFACTURER	AVAILABLE FROM
Aatrex (for agricultural use)	Atrazine	500 g/L F 90% WP	Ciba-Geigy	1, 5, 10, 14, 17, 18, 20
Aatrex-Nine-0	Atrazine	90% WDG	Ciba-Geigy	1, 5, 8, 10, 14, 17, 18, 20
Aatrex-Plus	Atrazine + petroleum oil	400 g/L F	Ciba-Geigy	1, 5, 10, 14, 17, 18, 20
Afolan F	Linuron	450 g/L F	Hoechst	1, 5, 8, 15, 17, 20, 22
Alanap 3	Naptalam	240 g/L EC	Uniroyal Chemical	25
Agriculture Weedkiller No. 1	mineral oil 100% aromatics 13-24%	100% SN	Ciba-Geigy	21
Allizol	amitrole	95% WSP	Allied Chemical Services Ltd.	Direct order from Allied
Amiben	Chloramben	240 g/L SN	Pfizer	1, 5, 14, 15, 17, 20, 22
Amitrol-T	Amitrole	200 g/L SN	Allied Chemical Services Ltd.	1, 5, 6, 8, 14, 17, 19, 20, 22
Amizine	Amitrole + Simazine 106 g/L + 53 g/L	159 g/L SN	Allied Chemical Services Ltd.	Direct order from Allied

TRADE NAME	GENERIC NAME	ACTIVE INGREDIENT AND FORMULATION	MANUFACTURER	AVAILABLE FROM
Asulox F	Asulam	400 g/L SN	May & Baker	1, 5, 6, 13, 14, 15, 16, 17, 18, 19, 20, 21
Atra-Mix	Atrazine + petroleum oil	400 g/L F	Chipman Chemicals	1, 2, 5, 17, 18, 19, 20, 22
Atra-pell	atrazine + 2,4-D(1:1)	10% G	Tam O'Shanter Industries Ltd.	12
Atrazine	Atrazine	80% WP	Chipman Chemicals	2 ,19
Atrazine 500	Atrazine	500 g/L F	Niagara	14
Atrazine 500	Atrazine	500 g/L F	Pfizer	16
Atrazine Liquid	Atrazine	500 g/L F	Chipman Chemicals	1, 2, 5, 8, 17, 19, 20, 22
Atrazine 80 W	Atrazine	80% WP	Niagara	14
Avadex BW	Triallate	400 g/L EC 10% G	Monsanto	1, 5, 6, 10, 14, 16, 17, 20
Avenge 200-C	Difenzoquat	200 g/L SN	Cyanamid of Canada Limited	1, 2, 5, 6, 10, 14, 16, 17, 18, 19, 20, 22
Banvel	Dicamba	400 g/L SN	Velsicol Corporation of Canada	1, 5, 6, 10, 14, 16, 17
Banvel 5 G	Dicamba	5% G	Velsicol Corporation of Canada	22
Basagran	Bentazon	480 g/L SN	BASF	5, 14, 17
Basamid Granular	Dazomet	98% G	BASF	5, 14
Basfapon	Dalapon	74% WSP	BASF	5, 8, 10, 14, 16
Benazolin	Benazolin	330 g/L SN	BFC Chemicals Inc	1, 5, 10, 11, 13, 14, 17, 18, 20
Betanal	Phenmedipham	150 g/L EC	Nor-Am Agri. Products Inc.	5, 14, 17
Betanex	Desmedipham	150 g/L EC	Nor-Am Agri. Products Inc.	5, 14, 17
Betasan	Bensulide	480 g/L EC 12.5% G	Stauffer Chemical Co.	1, 2, 5, 17, 18, 19, 21, 22
Bladex	Cyanazine	480 g/L F 80% WP	Ciba-Geigy	6, 14, 17, 19, 21
Blagal	Cyanazine + MCPA (1:2)	375 g/L SN	Ciba-Geigy	6, 14, 17, 20, 21, 22
Brominal M	Bromoxynil Octanoate + MCPA ester (225 g/L each)	400 g/L EC	Allied Chemical Services Ltd.	6, 8, 14, 18, 21
Bromox 450 M	Bromoxynil Octanoate + MCPA ester (225 g/L, each)	450 g/L EC	Allied Chemical Services Ltd.	16
Brushkiller 1:1 LV 600	2,4-D/2,4,5-T (1:1)	600 g/L EC	Niagara, Pfizer	8, 16
Brushkiller 2:1 LV 600	2,4-D/2,4,5-T (2:1)	600 g/L EC	Niagara	8
Buctril M	Bromoxynil Octanoate + MCPA ester (225 g/L, each)	450 g/L EC	May & Baker	1, 2, 5, 6, 11, 13, 14, 15, 16, 17, 18, 19, 20, 21
Calmix Pellets	Bromacil 3% + 2,4-D acid 5%	8% P	Allied Chemical Services Ltd.	1, 5, 6, 8, 14, 19, 20, 21
Carbyne 2 EC	Barban	240 g/L EC	Velsicol Corporation	1, 6, 8, 10, 14, 17, 18, 20, 22
Casoron 4G	Dichlobenil	4% G	Green Cross	5, 10, 14
Casoron G-4	Dichlobenil	4% G	Pfizer	16
Chloro-IPC	Chlorpropham	480 g/L EC	PPG Industries Stanchem	5, 9, 14, 24
Cobutox	2,4-DB iso-octyl ester Butyric	400 g/L	Interprovincial Co-op	6
Compitox	MCPP	150 g/L SN	May & Baker Limited	1, 5, 9, 15, 19
Compitox Plus	MCPP + 2,4-D (50%, 50%)	200 g/L SN	May & Baker Limited	1, 5, 9, 15, 19
Co-op Atrazine 500 F	atrazine	500 g/L F	Interprovincial Co-op	6
Co-op Atrazine 90 WP	atrazine	90% WP	Interprovincial Co-op	6
Co-op Garden Weed Preventer	Trifluralin	1.47% G	Interprovincial Co-op	6
Co-op Granular Soil Sterilant	Sodium Metaborate Tetrahydrate 66.5% Sodium chlorate 30% Diuron 1.25%	97.75% G	Interprovincial Co-op	6
Co-op Lawn Weed Killer	2,4-D	200 g/L SN	Interprovincial Co-op	6

TRADE NAME	GENERIC NAME	ACTIVE INGREDIENT AND FORMULATION	MANUFACTURER	AVAILABLE FROM
Co-op Premium Lawn Weed Killer	2,4-D + Mecoprop (125 g/L each)	250 g/L SN	Interprovincial Co-op	6
Co-op Premium Spot Weed Killer	2,4-D + Mecoprop amine (3 g/L each)	6 g/L SN	Interprovincial Co-op	6
Co-op Premium Turf Herbicide	2,4-D + Mecoprop (125 g/L each)	250 g/L SN	Interprovincial Co-op	6
Co-op Sodium TCA	sodium trichloroacetic acid	85% WSP	Interprovincial Co-op	6
Co-op Total Vegetation Control (Soil sterilant)	Sodium metaborate 68% Sodium chlorate 30% Boron equivalent 7.2%	105.2% G	Interprovincial Co-op	6
Co-op Weedrite granules	Paraquat 2.5% Diquat 2.5%	5% G	Interprovincial Co-op	6
Dalapon	Dalapon	74% WP 25% WSP	Allied Chemical Services Ltd. Chipman Chemicals Niagara Interprovincial Co-op Pfizer	most dealers
Desormone 7	Dichlorprop/2,4-D (1:1)	700 g/L EC	Allied Chemical Services Ltd.	Direct order from Allied
Diphenoprop 700	2,4-D/Dichlorprop (1:1)	700 g/L EC	Pfizer	16
Dowfume MC 2	Methyl Bromide	98%	Dow Chemical Canada Inc.	5, 9
Dowpon, Dowpon M	Dalapon	74% WP	Dow Chemical Canada Inc.	1, 5, 9, 19
Dual	Metolachlor	960 g/L EC	Ciba-Geigy	1, 5, 6, 10, 14, 17, 18, 20
Dy-Amine	2,4-D	500 g/L SN	Pfizer	16
Dyanap	Naptalan + Dinoseb 220 g/L + 110 g/L	330 g/L SN	Uniroyal	25
DyCleer (Industrial)	Dicamba	400 g/L SN	Velsicol Corporation	14, 19, 23
DyCleer 24 (Industrial)	Dicamba + 2,4-D 200 g/L + 400 g/L	600 g/L SN	Velsicol Corporation	19, 23
DyCleer 10 P (Industrial)	Dicamba	10% G	Velsicol Corporation	19, 23
Dytop	Dinoseb	300 g/L SN	Niagara	8, 14
DyVel	Dicamba + MCPAK 84 g/L + 336 g/L	420 g/L SN	Velsicol Corporation	1, 5, 6, 8, 14, 17, 19, 20, 21
Embark 1.55 PGR	Melfluidide	150 g/L SN	3M Corporation	22
Embutox E	2,4-DB iso-octyl ester (Butyric)	400 g/L EC	May & Baker (Canada) Ltd.	1, 2, 5, 6, 8, 9, 10, 15, 16 17, 18, 19, 20, 21, 22
Enide	Diphenamid	50% WP	TUCO Products	5, 9,16
Eptam 8-E	EPTC	800 g/L EC	Stauffer Chemical Co.	1, 2, 5, 17, 18, 19, 21, 22
Eptam 10G	EPTC	10% G	Stauffer Chemical Co.	1, 2, 5, 17, 18, 19, 21, 22
Eradicane 8-E	EPTC + Crop Protectant	800 g/L EC	Stauffer Chemical Co.	1, 2, 5, 17, 18, 19, 21, 22
Eramox (Industrial)	Atrazine + Simazine (40% + 40%)	80% WP	Ciba-Geigy	12
Estaprop	Dichlorprop + 2,4-D 300 g/L + 300 g/L	600 g/L EC	Niagara	8
Estemine MCPA	MCPA non volatile amine	500 g/L SN	Green Cross	5, 10, 17, 18
Estemine 2,4-D	2,4-D non volatile amine	500 g/L SN	Green Cross	5, 10, 17, 18, 19
Esteron 600 (Forestry)	2,4-D low volatile ester	600 g/L EC	Dow Chemical Canada Inc.	3
Esteron LV 600	2,4-D low volatile ester	600 g/L EC	Dow Chemical Canada Inc.	3
Esteron 99	2,4-D low volatile ester	500 g/L EC	Dow Chemical Canada Inc.	3
Formula 40 C	2,4-D amine	500 g/L SN	Dow Chemical Canada Inc.	3
Gramoxone	Paraquat	200 g/L SN	I.C.I. Plant Protection Ltd.	1, 2, 5, 17, 19, 20, 22
Gramoxone S	Paraquat	200 g/L SN	I.C.I. Plant Protection Ltd.	2, 5
Herbicide 273	Endothal	360 g/L EC	Pennwalt Corporation	5, 10, 17

TRADE NAME	GENERIC NAME	ACTIVE INGREDIENT AND FORMULATION	MANUFACTURER	AVAILABLE FROM
Hoe-Grass	Diclofop methyl	190 g/L EC	Hoechst	5, 6, 17, 20, 22
Hoe-Grass II	Diclofop Methyl bromoxynil (ester)	230 g/L + 80 g/L EC	Hoechst	5, 6, 17, 20, 22
Hyvar X	Bromacil	80% WP	DuPont Co.	1, 5, 6, 8, 17, 19, 20, 22, 24
Hyvar XL	Bromacil	240 g/L SN	DuPont Co.	1, 5, 6, 8, 15, 17, 19, 20, 22, 24
Karmex	Diuron	80% WP	DuPont Co.	4, 5, 8, 15, 16
Kerb 50 W	Propyzamide	50% WP	Rohm & Haas Canada Inc.	17, 19
Killex (single strength)	Dicamba (9 g/L), 2,4-D (100 g/L), Mecoprop (50 g/L)	159 g/L SN	Green Cross	10, 14
Killex (double strength)	Dicamba (18 g/L), 2,4-D (200 g/L), Mecoprop (100 g/L)	318 g/L SN	Green Cross	5, 10, 14
Kil-Mor	Dicamba (110 g/L), 2,4-D (310 g/L), Mecoprop (80 g/L)	500 g/L SN	Green Cross	5, 10, 11, 13, 14, 18
Krenite	Ammonium ethyl carbamoylphosphonate	480 g/L EC	DuPont of Canada Ltd.	4, 5
Krovar I	Bromacil + diuron (40% + 40%)	80% WP	DuPont Co.	5
Laddok	Bentazon + Atrazine (200 g/L each)	400 g/L F	BASF Canada Inc.	5, 6, 14, 17
Lasso	Alachlor	480 g/L EC	Monsanto	16
Lexone DF	Metribuzin	75% dry flowable	DuPont Co.	1, 5, 6, 8, 10, 13, 14, 15, 17, 19, 20, 22
Lexone L	Metribuzin	480 g/L F	DuPont Co.	1, 5, 6, 8, 10, 13, 14, 17, 19, 20, 22
Lorox L	Linuron	480 g/L F	DuPont Co.	1, 5, 6, 8, 10, 13, 14, 15, 16, 17, 19, 20, 22
Mataven	Flamprop methyl	84 g/L EC	Ciba-Geigy	6, 14, 17, 20, 21, 22
MCPA	(2-methyl-4 chlorophenoxy) acetic acid as esters amines and sodium salts	250 g/L 300 g/L 500 g/L	See 2,4-D	most dealers
MCPAK 400	Potassium salt of MCPA	400 g/L SN	Interprovincial Co-op	1, 6, 16, 17
Mecoprop 300	MCPP	150 g/L SN	Pfizer	16
Mecoturf	MCPP (D-isomer)	150 g/L SN	Niagara	5, 8
Mecoturf plus 2,4-D	MCPP (D-isomer), + 2,4-D 200 g/L + 200 g/L	400 g/L SN	Niagara	5, 8
Mylone	Dazomet	50% G	Green Cross	10
NaTA TCA	Sodium Trichloroacetic acid	85% WSP	Hoechst	6, 8, 16, 17, 19, 20, 22
Nortron	Ethofumesate	180 g/L EC	Fisons	6, 7, 19
Pardner	Bromoxynil	225 g/L EC	May & Baker	2, 5, 11, 13, 14, 16, 18, 19, 20, 21
Poast	Sethoxydim	184 g/L EC	BASF Canada Inc.	5, 6, 14, 17, 22
Phenoxylene Plus	MCPA (sodium potassium salts)	250 g/L SN	Fisons	7, 8
Potato Top Killer 300	Dinoseb	300 g/L 3 SN	Dow Chemical Canada Inc.	3
Prefar	Bensulide	480 g/L EC	Stauffer Chemical Co.	1, 2, 5, 17, 18, 19, 20, 22
Premerge 360	Dinoseb	360 g/L SN	Dow Chemical Canada Inc.	5, 6, 19
Primatol (Industrial)	Atrazine	80% WP 500 g/L F	Ciba-Geigy	12
Primatol Granular (Industrial)	Atrazine + 2,4-D (5% + 5%)	10% G	Ciba-Geigy	12
Primextra	Metolachlor (300 g/L), Atrazine (190 g/L), Related active triazines (10 g/L)	500 g/L F	Ciba-Geigy	6, 10, 14

TRADE NAME	GENERIC NAME	ACTIVE INGREDIENT AND FORMULATION	MANUFACTURER	AVAILABLE FROM
Princep Nine-T (Agricultural)	Simazine	90% WDG	Ciba-Geigy	5, 10, 14, 17, 18
Princep 4 G (Agricultural)	Simazine	4% G	Ciba-Geigy	5, 10, 14, 16, 17
Propaturf	2,4-D + dichloroprop (350 g/L)	700 g/L EC	Niagara	5, 8
Randox	CDAA	480 g/L EC	Monsanto	5, 15
Reglone	Diquat	200 g/L SN	Plant Protection Ltd.	1, 2, 5, 17, 19, 20
Reglone A	Diquat	200 g/L SN	Plant Protection Ltd.	1, 2, 5, 17, 19, 20
Ro-Neet 7.2E	Cycloate	720 g/L EC	Stauffer Chemical Co.	1, 2, 5, 17, 18, 19, 20, 22
Roundup	Glyphosate	356 g/L SN	Monsanto	1, 5, 6, 10, 14, 16, 17, 15, 20, 22
Sabre	Bromoxynil (Octanoate and Butyric) + MCPA ester (360 g/L each)	720 g/L EC	Allied Chemical Services	1, 6, 11, 13, 14, 16, 17, 18, 19, 20, 21, 22
Sencor 500	Metribuzin	500 g/L F	Chemagro	1, 10, 16, 17, 19, 20, 22
Sencor 75 DF	Metribuzin	75% dry flowable	Chemagro	1, 10, 15, 17, 19, 20, 22
Silvaprop LV700 1-1 Brushkiller	2,4-D + dichloroprop (50%) + (50%)	700 g/L EC	Niagara	5, 8
Simadex	Simazine	500 g/L F	Fisons	8
Simadex 80 W	Simazine	80% WP	Fisons	8
Simmaprim (Industrial, Aquatic)	Simazine	80% WP	Ciba-Geigy	5, 12
Sinbar	Terbacil	80% WP	DuPont	1, 5, 6, 8, 16, 17, 19, 20, 21
Sinox General	Dinoseb	600 g/L SN	Niagara	8
Sinox PE	Dinoseb	360 g/L SN	Niagara	5, 8, 14, 16
Spike	Terbuthiuron	80% WP 5% G	Elanco	1, 8, 14, 17, 20
Stampede 360	Propanil	360 g/L SN	Rohm & Haas	1, 5, 6, 14, 16, 17, 20, 22
Stampede CM	Propanil + MCPA 360 g/L + 100 g/L	460 g/L EC	Rohm & Haas	1, 5, 6, 16, 17, 20, 22
Sutan+	Butylate	800 g/L EC	Stauffer Chemical Co.	1, 2, 5, 17, 18, 19, 20, 22
Sweep	Paraquat	250 g/L SN	Chipman Inc.	1, 2, 5, 17, 19, 20, 22
Target	MCPA (275 g/L), Mecoprop (62.5 g/L), Dicamba (62.5 g/L)	400 g/L SN	Green Cross	5, 10, 11, 13, 14, 18
TCA solution	Sodium Trichloroacetic acid	568 g/L SN	Pfizer	15
Tenoran	Chloroxuron	50% WP	Ciba-Geigy	5, 10
Topper	Dinoseb	300 g/L SN	Uniroyal	25
Torch	Bromoxynil octanoate	227 g/L EC	Allied Chemical Services Ltd.	1, 6, 8, 14, 17, 19, 20, 21
Torch DS	Bromoxynil (Octanoic and Butyric)	450 g/L EC	Allied Chemical Services	1, 6, 11, 13, 14, 16, 17, 18, 19, 20, 21, 22
Tordon 22 K	Picloram	240 g/L SN	Dow Chemical Canada Inc.	3, 15
Tordon 101	Picloram + 2,4-D (60 g/L) + (240 g/L)	300 g/L SN	Dow Chemical Canada Inc.	3, 15
Tordon 10K	Picloram	10% P	Dow Chemical Canada Inc.	3
Tordon 202 C	Picloram + 2,4-D (1:16)	212 g/L SN	Dow Chemical Canada Inc.	1, 6, 16, 17, 19, 20, 22
Totril	Ioxynil	225 g/L EC	May & Baker	5, 14, 15, 19
Treflan EC	Trifluralin	400 g/L EC 545 g/L EC	Elanco Products	1, 6, 14, 15, 17, 20, 22
Treflan QR 5	Trifluralin	5% G	Elanco Products	1, 6, 14, 15, 17, 20, 22
Tropotox	Sodium salt of MCPB	400 g/L SN	May & Baker	1, 2, 5, 6, 8, 9, 14, 16, 17, 18, 19, 20, 21, 22
Tropotox Plus	MCPB and MCPA	400 g/L SN	May & Baker	1, 2, 5, 6, 8, 9, 14, 15, 16 17, 18, 19, 20 , 21, 22

TRADE NAME	GENERIC NAME	ACTIVE INGREDIENT AND FORMULATION	MANUFACTURER	AVAILABLE FROM
2,4-D	2,4-dichlorophenoxy acetic acid, low volatile esters and amines	250 g/L 300 g/L 500 g/L 600 g/L 800 g/L	Allied Chemical Services Ltd.; Chipman Chemicals, Federated Co-op, Dow Chemical Canada Inc., Fisons, Green Cross, Niagara, Pfizer, Shell Oil, Stanchem, Oliver Chemicals, Uniroyal	Most dealers
2,4-D Butyric 400	2,4-DB, as mixed butyl esters	400 g/L EC	Pfizer	16
Vapam	Metam	380 g/L	Stauffer Chemical Co.	1, 2, 5, 17, 18, 19, 20, 22
Velpar	Hexazinone	90% WSP	DuPont of Canada Ltd.	4, 5,
Vorlex	Methyl 150, Thiocyanate + C_3 Hydrocarbons (225 g/L) + (900 g/L)	1125 g/L	NorAm	16
Weed-No-More	2,4-D	150 g/L SN	Green Cross	10, 14
Yellow Stuff PE	Dinoseb	360 g/L SN	Uniroyal	25

PRODUCT AVAILABILITY CODES

1. Cargill Grain
2. Chipman Chemical Dealers
3. Dow Chemical Canada Inc.
4. DuPont Canada Inc.
5. Even Spray and Chemicals Ltd.
6. Federated Co-operatives (Interprovincial)
7. BFC Chemicals Inc.
8. Niagara Dealers
10. Green Cross Dealers
11. Gulf Oil (Service Centres and bulk dealers)
12. Harrisons and Crosfield
13. Imperial Oil (bulk dealers)
14. Independent Dealers
15. King Agri-Serve Inc.
16. Pfizer
17. Manitoba Pool
18. NM Paterson
19. Oliver Chemicals
20. Pioneer Grain
21 Shell (Bulk Fuel Dist.)
22. United Grain Growers
23. Velsicol Canada Inc.
24. Stanchem
25. Uniroyal

MANITOBA AGRICULTURE

TABLE 15 1984 Field Crops Chart — Recommended Herbicides

CROPS AND WEEDS / HERBICIDES	CROPS: CEREALS					CROPS: OIL SEEDS					CROPS: OTHER						
	Barley	Oats	Rye	Triticale	Wheat	Flax	Mustard	Rapeseed (Canola)	Soybeans	Sunflowers	Bean, Field	Canary Seed	Fababeans	Lentils	Peas	Tame Buckwheat	
AFOLAN/LOROX + MCPA amine	X	X			X												
AMIBEN + TREFLAN									X[2]	X[2]							
ASULOX F						X											
AVADEX BW	X				X	X	X	X							X[3]		
AVENGE 200C	X		X[18]	X[1]	X[4]							X					
BANVEL + MCPA or 2,4-D	X	X[5]			X							X[5]					
BASAGRAN						X			X		X		X		X		
BASFAPON/DALAPON/ DOWPON/DOWPON M						X		X							X	X[6]	
BENAZOLIN								X									
BLAGAL	X	X			X	X											
BROMINAL M, BROMOX 450 M/ BUCTRIL M/SABRE	X	X			X	X						X					
DYVEL	X	X			X												
EPTAM						X[8]				X[8]	X[2]						
ESTAPROP	X				X												
HOE-GRASS	X[9]		X	X	X	X	X	X	X	X[10]	X		X	X	X	X	
HOE-GRASS II	X[9]				X	X											
KIL-MOR	X	X			X												
LEXONE/SENCOR	X[11]				X					X[12]				X	X[12]		
MATAVEN				X	X[13]					X		X					
MCPA	X	X	X		X	X									X[14]		
NaTA TCA/TCA solution	X	X				X		X							X[15]		
NaTA TCA + MCPA or 2,4-D	X	X[5]				X[5]											
PARDNER/TORCH/TORCH DS	X	X		X	X	X[19]						X					
POAST						X		X	X								
PREMERGE/SINOX/ YELLOW STUFF											X		X		X		
SENCOR + TREFLAN													X[8]				
STAMPEDE 360	X	X			X	X											
STAMPEDE CM	X	X			X	X											
TARGET	X	X			X												
TORDON 202C	X				X												
TREFLAN	X[16]				X[16]	X[17]	X[8]	X[8]	X[8]	X[8]	X[8]		X[8]	X[17]	X[8]		
TROPOTOX PLUS															X		
2,4-D	X		X		X												

WEEDS: Barnyard Grass; Foxtail, Green; Foxtail, Yellow; Wild Oats; Quack Grass; Bindweed, Field; Blue Bur; Buckwheat, Tartary; Buckwheat, Wild; Burdock; Catchfly, Night-flowering; Chickweed; Cleavers; Cockle, Cow; Cocklebur; Corn spurry; Dandelion; Dragonhead, American; Flixweed; Galinsoga, Hairy; Goat's-beard; Goosefoot, Oak-leaved; Hemp-nettle; Knotweed, Prostrate; Kochia; Lamb's-Quarters; Lettuce, Prickly; Mustard, Ball; Mustard, Dog; Mustard, Hare's ear; Mustard, Indian; Mustard, Tumble; Mustard, Wild; Mustard, Wormseed; Pigweed, Prostrate; Pigweed, Red Root; Pigweed, Russian; Pigweed, Tumble; Purslane; Radish, Wild; Ragweed, Common; Ragweed, False; Ragweed, Giant; Russian-thistle; Shepherd's Purse; Annual Smartweed Species, Lady's Thumb; Sow Thistle (Annual); Sow Thistle (Perennial); Spurge, Thyme-leaved; Stinkweed; Sunflower, Prairie; Sweet Clover, White

MG-5053

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REFER TO 1984 GUIDE TO CHEMICAL WEED CONTROL AND PRODUCT LABELS FOR COMPLETE DETAILS.

Mustard, Indian	Mustard, Tumble	Mustard, Wild	Mustard, Wormseed	Pigweed, Prostrate	Pigweed, Red Root	Pigweed, Russian	Pigweed, Tumble	Purslane	Radish, Wild	Ragweed, Common	Ragweed, False	Ragweed, Giant	Russian-thistle	Shepherd's Purse	Annual Smartweed Species, Lady's Thumb	Sow Thistle (Annual)	Sow Thistle (Perennial)	Spurge, Thyme-leaved	Stinkweed	Sunflower, Prairie	Sweet Clover, White	Thistle, Canada	VOLUNTEER CROPS: Buckwheat, tame	Cereal grains (wheat, barley, rye)	Cereal grains (lame oats)	Corn	Flax (suppression only)	Mustard, Rapeseed	Sunflowers	COMMENTS
																													DO NOT ALLOW SPRAY TO DRIFT FROM THE TARGET AREA.
●	●	●	●	○	●	●		●	●	●	●	●		●	●	●		○	●	○		□						○	Refer to the Guide for mixing instructions
		●			●			●		●			●		●				●					○						Incorporate thoroughly
		S													S				S					○	○					Can be tank mixed with Buctril M
																									○					Incorporate thoroughly. Can be tank mixed with Treflan for green foxtail control in barley and wheat. Use liquid only on peas
																														Can be tank mixed with Brominal M, Bromox 450 M, Buctril M, MCPA ester, 2,4-D LV Ester, Pardner, or Torch
●	●	●	●	●	●	●			●	●	●	●	●	●	●	●	□		●	○	●	□					S[b]	○	○	Apply early for maximum crop safety
		●			●			●		●		●	●	●	●				●			□[c]								Thorough coverage is required
		S																												On peas may be tank mixed with Tropotox
	●	●	●		●										●	○	□		●			□								Primarily for wild mustard control in seed production rapeseed
	●	●	●	○	●					S			●	●	●	○	□[g]		●	○		□[g]	●					●[d]	●	Apply when weeds are in the 2 to 5 leaf stage
●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	○	□		●			□						○	●	Apply early before crop shades the weeds. Also controls scentless chamomile
				●	●		●	●																●	●					Apply early for maximum crop safety
●	●	●	●		●	●				●	●	●	●	●	●	●	□		●			□								Incorporate thoroughly. Granular formulation for use in the spring only
																														Also controls Stork's bill
		●											●		●				●						○	●				Can be tank mixed with Pardner or Torch on wheat, barley or flax
●	●	●	●	●	●	○				●	●	●	●	●	●	●	□		●	○	○	□			○	●				Do not apply to Flax under stress due to hot (28°C) or humid weather
		★			●								●		●				★								S	○	○	Apply early for maximum crop safety
★	★	★	★			★	●	●	★	★	★	★		★		●	□	★	★	○	●	□						★[d]		Can be tank mixed with 2,4-D, MCPA or Banvel for use on barley or wheat
																									○					Do not apply on Selkirk wheat
																												○	S	Avoid spray drift
●	●	●	●			●			●	●		●		●					●											On field peas, may be tank mixed with MCPA or Tropotox
		●			●								●		●				●								S			Pre-mix NaTA, TCA in warm water and add to the tank first
																														For broader spectrum weed control can be tank mixed with MCPA or 2,4-D (except triticale).
																							●	●	●					Avoid spray drift onto cereal crops.
		●																	●									●		On peas, may be tank mixed with Dalapon
		●	●		●			●					●	●	●				●						○			●[d]		Soil residue may restrict following crop. Refer to the Guide
					●									●	●				●[e]											Spray when the majority of green foxtail plants are in the 3 leaf stage. When tank mixed with MCPA ester see Stampede CM for weeds controlled
		●			●									●	●				●									●		Spray when the majority of green foxtail plants are in the 3 leaf stage
●	●	●	●	●	●	○				●	●	●	●	●	●	●	□		●	○	○	□						○	○	Apply early for maximum crop safety
		●			●									●	●	○	□		●			□								Soil residue may restrict following crop. Refer to Guide or label.
					●			●						●											○					Incorporate thoroughly. Granular formulation to be used only on flax, mustard, peas, rapeseed and sunflowers. Treflan can also be used on Crambe.
		●	●		●				●	●	●	●		●		●	□		●			□								Tropotox should be used on sensitive canning peas.
★	★	★	★			★	○	●	★	★	★	★	●	★		●	□	★	★	○	○	□					S[f]	○	S	Avoid spray drift.

Stop Spray Drift
Calibrate Your Sprayer

ADDITIONAL WEEDS SUSCEPTIBLE TO 2,4-D AND MCPA FOR TOP GROWTH CONTROL (840 g/ha, 12 oz/acre, ACTIVE)

Both: Biennial wormwood, blue lettuce, broadleaved plantain, common peppergrass, creeping buttercup, gumweed, hedge bindweed, hoary cress, leafy spurge, pineappleweed

MCPA only: Field horsetail, Russian knapweed

WEEDS WITH NO RECOMMENDED CHEMICAL CONTROL IN THE ABOVE CROPS

campion, bladder
cockle, white (established)
cockle, purple
daisy, ox-eye
false-flax, small seeded
may weed, stinking
pepper grass, clasping-leaved
poverty weed

GOLDEN RULES FOR EFFECTIVE WEED CONTROL

Identify your weed problem
Select the proper herbicide for the crop and the weeds
Use amine formulations of 2,4-D and MCPA for greater crop safety and to reduce the volatility hazard
Adjust and calibrate your sprayer
Apply herbicides at the proper stage for maximum weed control and crop safety
Take time to do a proper job of application
Leave check strip to compare results
Check fields frequently throughout the season to assess results
Look for ways to improve next year's weed control program

LEGEND: CROPS

X Recommended on crop. See Guide for rates.
1 Welsh and Carman varieties only.
2 Apply in spring only.
3 Field peas only.
4 Glenlea, Neepawa, Selkirk, Chester, Macoun, Canuck and Benito only.
5 Use MCPA only.
6 Use Baslapon only.
7 Do not use Wypout 250 on Park spring wheat.
8 Apply spring or fall.
9 Do not use on Klages, Betzes, Norbert or Glenn.
10 Do not use on Corona.
11 Do not use on Klondike.
12 Use Sencor only.
13 Do not use on Selkirk wheat.
14 Use sodium salt only.
15 Use on field peas only.
16 Post-plant incorporated to control green and yellow foxtail only.
17 Apply in fall only.
18 Use on Cougar, Puma, Frontier, Rymin and Kodiak only.
19 Use Torch or Torch DS only.

LEGEND: WEEDS

● Controlled by maximum rates recommended for crops. Where two brand names are recommended, the weed may not appear on both labels.
★ Controlled by rates less than the maximum recommended for crops.
S Suppression.
O Not labelled for control but adequate control can be expected.
□ Top growth control only.
a Use MCPAK for hemp nettle control.
b Use Banvel + 2,4-D only.
c Split applications required for adequate control.
d Volunteer rapeseed only on product label.
e Rosette stage only.
f Use LV ester only.
g Regrowth can be expected.

MANITOBA AGRICULTURE

TABLE 16 1984 Forage Crops Chart — Recommended Herbicides

● Do Not Allow

HERBICIDES	GRASSES: Bromegrass	Creeping Red Fescue	Crested Wheatgrass	Intermediate Wheatgrass	Kentucky Bluegrass	Meadow Fescue	Orchardgrass	Reed Canarygrass	Russian Wild Ryegrass	Slender Wheatgrass	Tall Wheatgrass	Timothy	SEEDLING LEGUMES: Alfalfa	Alsike Clover	Red Clover	Sweet Clover	Trefoil	White Dutch Clover	ESTABLISHED LEGUMES: Alfalfa	Alsike Clover	Red Clover	Sweet Clover	Trefoil	White Dutch Clover	COVER CROPS: Barley	Flax	Oats	Wheat
ASULOX F													X[1]						X[1]							X		
ASULOX F + EMBUTOX E													X[1]						X[1]									
AVADEX BW													X[2]	X[2]	X[2]	X[2]	X[2]	X[2]							X	X		X
AVENGE 200C	X[2]	X[2]	X[2]		X[2]		X[2]	X[2]	X[2]			X[2]	X[2]		X[2]	X[2]	X[2]								X			X
BANVEL		X[3]							X																X		X	X
BANVEL + 2,4-D OR MCPA		X[3]																							X		X[9]	X
BUCTRIL M	X[5]	X[5]	X[5]	X[5]		X[5]	X[5]	X[5]	X[5]	X[5]	X[5]	X[5]													X	X	X	X
CARBYNE 2EC	X																		X	X	X	X						
COBUTOX, EMBUTOX E, 2,4-D BUTYRIC 400													X	X			X	X							X		X	X
DALAPON, DOWPON, DOWPON M, BASFAPON													X				X									X		
EPTAM													X				X											
HOE-GRASS	X[5]	X[5]	X[5]	X[5]					X[5]				X[5]		X[5]	X[5]									X	X		X
HOE-GRASS + TORCH OR TORCH DS	X[5]	X[5]	X[5]	X[5]					X[5]																X	X		X
KERB																			X				X					
MATAVEN	X[4]	X[4]		X[4]		X[4]			X[4]				X[4]															X
MCPA OR 2,4-D	X[6]	X[6]	X[6]	X[6]	X[6]	X[6]	X[6]	X[6]	X[6]	X[6]	X[6]	X[6]	X[7]	X[7]	X[7]			X[7]	X[8]						X	X[9]	X[9]	X
PARDNER, TORCH, TORCH DS	X[4]	X[4]	X[4]	X[4]		X[4]	X[4]	X[4]	X[4]	X[4]	X[4]	X[4]													X	X[12]	X	X
PARDNER + 2,4-D OR MCPA	X[4]	X[4]	X[4]	X[4]		X[4]	X[4]	X[4]	X[4]	X[4]	X[4]	X[4]													X		X[9]	X
PRINCEP NINE-T, SIMADEX 80W, SIMADEX FLOWABLE																			X[10]				X					
ROUNDUP	X[11]	X[11]	X[11]	X[11]	X[11]	X[11]	X[11]	X[11]	X[11]	X[11]	X[11]	X[11]	X[11]	X[11]	X[11]	X[11]	X[11]	X[11]							X[11]	X[11]	X[11]	X[11]
SINBAR																			X									
TROPOTOX PLUS														X	X			X							X		X	X

WEEDS	Barnyard Grass	Blue Grass	Foxtail Barley	Foxtail, Green	Foxtail, Yellow	Wild Oats	Alyssum, Hoary	Bindweed, Field	Blue Bur	Buckwheat, Wild	Burdock	Catchfly, Night-flowering	Chickweed	Cleavers	Cockle, Cow	Cocklebur	Dandelion	Dock, Curled	Dragonhead, American	Flixweed	Goat's-Beard	Goosefoot, Oak-leaved	Hawk's Beard, Narrow-leaved	Hemp-nettle	Knotweed, Prostrate	Kochia	Lamb's-quarters	Lettuce, Prickly	Mustard, Ball	Mustard, Dog	Mustard, Hare's-ear
ASULOX F	S			S		●			S	S																				
ASULOX F + EMBUTOX E	S			S		●			●	●																				
AVADEX BW						●																								
AVENGE 200C						●																								
BANVEL										●					●															
BANVEL + 2,4-D OR MCPA								□	●	●	●			●	●	●	●	■	○	●	●	●		●			●	●	●	●
BUCTRIL M									●	●					●	●			S	●							●		●	
CARBYNE 2EC						●																				●				
COBUTOX, EMBUTOX E, 2,4-D BUTYRIC 400							○	■		■								■[y]				■	■			●		●		
DALAPON, DOWPON, DOWPON M, BASFAPON				●	●																									
EPTAM	●	○	○	●	●	●						●															●			
HOE-GRASS	●			●	●	●																								
HOE-GRASS + TORCH OR TORCH DS	●			●	●	●				●					●	●											●	●		
KERB			●																											
MATAVEN						●																								
MCPA OR 2,4-D								□	●		●					●	□	■[y]	○[m]	●	●	●		●[k]			●	●	●	●	●
PARDNER, TORCH, TORCH DS										●					●	●											●	●		
PARDNER + 2,4-D OR MCPA								□	●	●	●				●	●	□	■	S	●	●	●		●[k]			●	●	●	●	
PRINCEP NINE-T, SIMADEX 80W, SIMADEX FLOWABLE	●			○	●	●	○		○	●		○	○							○		○					○	○	○	○	○
ROUNDUP		●		●		●		□		●																	●	●	●		
SINBAR	●	●	●	●	●	○	○		○	○		○	●					[y]		○		○		○	○	○	●	●	●	●	●
TROPOTOX PLUS							○	□										S	○					S			●		●		

NOTES: CROPS

X — Product is recommended for the crop.

1. Use Asulox F only on alfalfa intended for seed production.
2. Use only on seedling grasses or legumes which are underseeded.
3. For seed production only.
4. For seed production only, only in the seedling year. Do not graze or harvest for livestock feed in the year of treatment.
5. Use only in the year of establishment. Do not graze or harvest for livestock in the year of treatment.
6. Use only 2,4-D amine. Not all brands are registered for this use.
7. Use only when underseeded to flax. Do not use 2,4-D on flax.
8. For use as a spot treatment only to control red bartsia.
9. Do not use 2,4-D on flax or oats.
10. Do not apply in the seedling year. Use Princep Nine-T only.
11. Seedling year only. Apply preplant or preemergence to crop but postemergence to weeds.
12. Torch or Torch DS only.

LEGEND: WEEDS

- ● Controlled by rates recommended for crops. Where more than one brand name is recommended, the weed may not appear on all labels.
- ○ Not labelled for control but adequate control can be expected.
- ■ Controlled by higher recommended rates only.
- □ Top growth control only.

S Suppression.
a Regrowth can be expected.
d Controlled by 2,4-D only.
k Controlled by MCPAK only.
m Controlled by MCPA only.
y Young plants only.

STAGES OF ALFALFA, RED C
ALSIKE CLOVER LEAF DEVE

UNIFOLIOLATE 1 TRIFOL

MG-6512 Revised December 1983

Herbicides

● Do Not Allow Spray to Drift From Target Area

● Stop Spray Drift

Blue Bur	Buckwheat, Wild	Burdock	Catchfly, Night-flowering	Chickweed	Cleavers	Cockle, Cow	Cocklebur	Dandelion	Dock, Curled	Dragonhead, American	Flixweed	Goat's-Beard	Goosefoot, Oak-leaved	Hawk's Beard, Narrow-leaved	Hemp-nettle	Knotweed, Prostrate	Kochia	Lamb's-quarters	Lettuce, Prickly	Mustard, Ball	Mustard, Dog	Mustard, Hare's-ear	Mustard, Indian	Mustard, Tumble	Mustard, Wild	Mustard, Wormseed	Pigweed, Prostrate	Pigweed, Red Root	Pigweed, Russian	Pigweed, Tumble	Plantain, Common	Purslane	Radish, Wild	Ragweed, Common	Ragweed, False	Ragweed, Giant	Russian-thistle	Shepherd's Purse	Smartweed, Lady's Thumb	Sow Thistle (Annual)	Sow Thistle (Perennial)	Stinkweed	Sunflower, Prairie	Sweet Clover, White	Thistle, Canada	COMMENTS
																									S														S			S				**NOTE: REFER TO GUIDE TO CHEMICAL WEED CONTROL AND PRODUCT LABELS FOR COMPLETE DETAILS**
S	S																								S												S			S				Use on alfalfa for seed production only. May be tank mixed with Embutox E to improve control of broad-leaved weeds. Do not use tank mix when alfalfa is sown with a flax cover crop.
●	●																								●												●			●				Apply to alfalfa less than 15 cm in height. If applied to alfalfa under stress, bloom may be delayed.
																																													See Guide for incorporation instructions.
																																													Do not tank mix with herbicides for control of broad-leaved weeds.
	●					●																															●					●	□	Can be tank mixed with MCPA or 2,4-D.
●	●	●			●	●	●	●	■ᵛ		●	●	●		●			●	●	●	●	●	●	●	●			●			●	●	●	●	●	●	●	●	□	●	●	□	Use only on stands for seed production.
●	●					●	●			S	●						●	●		●				●	●		●						●			●	●		□	●		□	Also controls scentless chamomile.
																																												Apply at the 2 leaf stage of wild oats. Use only on established stands.
	■								■ᵛ				■	■				●		●					●	●		●			■		●	●	●		●		○	S	●			Best results are obtained when plants are actively growing in the seedling stage. May be used on pastures containing forage legumes.
																																												Do not feed treated legume to dairy cattle or animals for slaughter the year of treatment.
			●															●									●	●		●															Spring application only. Refer to GUIDE for incorporation instructions.
																																												Can be tank mixed with Torch for use on grasses only.
●		●					●	●	□	■ᵛ	○ᵐ	●	●	●	●ᵏ			●	●	●	●	●	●	●	●			●	●		●	●	●	●	●	●	●	●	●		●		●	○	●		Apply in the fall between October 1 and freeze up.
	●						●	●										●	●																										Apply when wild oats are in the three to six leaf stage.
●	●	●					●	●	□	■ᵛ	S	●	●	●	●ᵏ			●	●	●	●	●	●	●	●			●	●		●	●	●	●	●	●	●	●	●		●		●	○	●		Best results are obtained when plants are actively growing in the seedling stage.
																																												Apply up to the four leaf stage of the weeds. Mustard past the three leaf stage will not be controlled.
																																												Provides better control of wild mustard than Pardner applied alone.
																																												Has activity on almost all seedling grasses and broad-leaved weeds. See Guide for comment on soil residue.
																																												Apply preplant or preemergence to crop but postemergence to weeds.
																																												Has activity on almost all seedling grasses and broad-leaved weeds. See Guide for comment on soil residue.
																																												Must be sprayed when weeds are actively growing in the 2-4 leaf stage.
										S	○				S				●												■		S		○		■			S	□	●		

crops. Where more
d, the weed may not

control can be

tes only.

S	Suppression.
a	Regrowth can be expected.
d	Controlled by 2,4-D only.
k	Controlled by MCPAK only.
m	Controlled by MCPA only.
y	Young plants only.

STAGES OF ALFALFA, RED CLOVER AND ALSIKE CLOVER LEAF DEVELOPMENT

STAGES OF BIRDSFOOT TREFOIL LEAF DEVELOPMENT

POOR

QUALITY

ORIGINAL